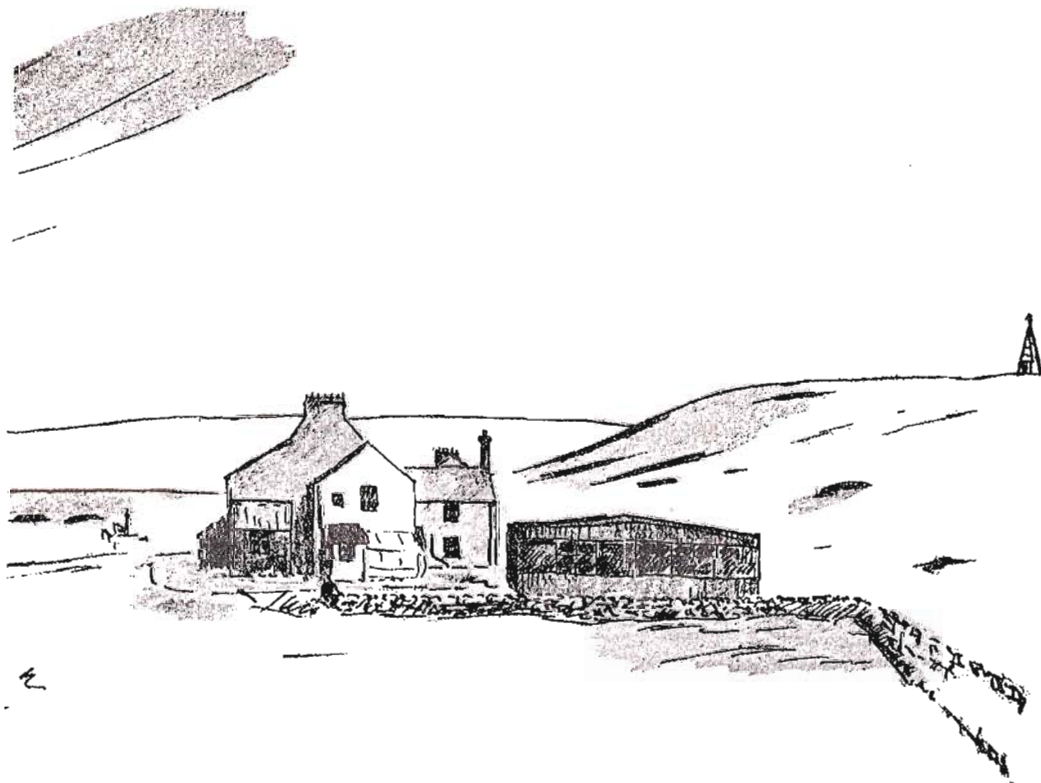


Aspects of the Ecology of The Northern Pennines

Occasional Papers

No. 12.



MOOR HOUSE

ASPECTS OF THE ECOLOGY OF THE NORTHERN PENNINES

12. BOTANICAL SPECIES LISTS FOR MOOR HOUSE NATIONAL NATURE RESERVE

M. Rawes - 1981

The intention of this Occasional Paper is to bring together, and up-date, published work, Reserve records and filed information on flowering plants, ferns, mosses, liverworts, lichens, fungi and algae. Where possible the species are briefly annotated, but the treatment, and the completeness, is variable; for example only a small fraction of the probable algae have been recorded.

It has not been my intention to detail all localities, but to give examples and stimulate a response from botanists to seek and supply new records. A great advantage of the Occasional Paper series is that it allows for simple amendment and addition, and this should be done regularly.

As plants do not recognise artificial boundaries, opportunity has been taken to include some species occurring just outside the Reserve, but within 1 km of it.

A recurrent problem with any list is that of nomenclature. Check lists and authorities used are given with each group. The flowering plant and fern list is almost entirely the same as the published paper by A. Eddy and D. Welch (1967), and the bryophytes have been based on A. Eddy and D. Welch (1969). The other groups have not been published.

Thanks are due to many people. I am particularly grateful to A. Eddy and D. Welch for permission to use their published material and for help in the bryophyte revision. The flowering plant and bryophyte lists have benefitted from the surveys, started in 1970, of Dr. A.J. Richards and his Newcastle team; P.W. James, British Museum (Natural History), is responsible for naming most of the lichens, whilst D. Welch collected many of the specimens; the fungal list is based on J.P. Houlton's Reserve Record entry and the draft was re-written by Pam Latter with help from Dr. Juliet Frankland; D.M. Tattersfield compiled the algal list with detail from N.T.H. Holmes (Durham); whilst Linda Robinson (Nee Teasdale) assisted in the maintenance of all records, and of adding to them.

A number of species have been the subject of detailed ecological, physiological and biogenetic study. Readers should consult the publication list (Occasional Paper No. 2) for further information.

A. SPERMATOPHYTA AND PTERIDOPHYTA

1. Flowering plants, ferns, horsetails and clubmosses.

The nomenclature and species numbering is based on Dandy (1958) with changes (Dandy, 1969) but the Hieracia follow the naming and numbering in the Critical Supplement to the Atlas of the British Flora (1968) and the Taraxaca are similarly treated according to A.J. Richards (1972). The confirmation of naming in the critical genera has been by Dr. M.E. Bradshaw for the Alchemilla, and the Hieracia by Dr. C. West and Mr. P.D. Sell. Much of the collecting of the latter was by D. Welch. The following initials have been used in this and the other sections:-

R.W.M.C. (Dr. Corner), J.A.C. (Mr. Crabbe), N.T.H.H. (Dr. Holmes), A.C.J. (Mr. Jermy), H.G.P. (Rev. Proctor), A.J.R. (Dr. Richards), K.T. (Dr. Taylor), L.T. (Linda Teasdale), D.W. (Mr. Welch), P.F.Y. (Mr. Yeo) and M.R. (Mr. Rawes).

- 1/1 Lycopodium selago L. Rare on blanket bog, occasional in crevices of sandstone rocks.
- 1/5 L. alpinum L. Uncommon and occasional in high-level Festuca grassland, and on disused lead mine heaps.
- 2/1 Selaginella selaginoides (L.) Link. Frequent in Agrostis-Festuca grassland.
- 4/4 Equisetum variegatum Schleich. ex Web. & Mohr. Rare, found in Middle Tongue Beck.
- 4/5 E. fluviatile L. Common in pools, especially old mine shafts and levels.
- 4/6 E. palustre L. Frequent in wet calcareous grassland and flushes.
- 4/7 E. sylvaticum L. Rare. Sandstone ledges of Force Burn waterfall.
- 4/9 E. arvense L. Infrequent, found near Moor House and on sandstone ledges in Swindale.
- 7/2 Hymenophyllum wilsonii Hook. Uncommon, on sandstone cliffs, Crowdundle. Coll. R.W.M.C., det. J.A.C. (1969).

- 8/1 Pteridium aquilinum (L.) Kuhn. Confined to the drier soils on the western escarpment below 500 m. O.D.
- 9/1 Cryptogramma crispa (L.) R.Br. ex Hook. Frequent among sandstone scree.
- 13/1 Blechnum spicant (L.) Roth. Occasional on acid drift and rocks.
- 14/1 Phyllitis scolopendrium (L.) Newm. Rare on limestone rocks. Knock Ore Gill, Green Burn mine shaft, Troutbeck Mine.
- 15/1 Asplenium adiantum-nigrum L. On limestone rocks. Rough Sike.
- 15/5 A. trichomanes L. Occasional on rock, especially at lower altitudes.
- 15/6 A. viride Huds. Common on limestone.
- 15/7 A. ruta-muraria L. Occasional on rocks.
- 18/1 Athyrium filix-femina (L.) Roth. Occasional among shaded rocks.
- 19/1 Cystopteris fragilis (L.) Bernh. Common on limestone.
- 21/1 Dryopteris filix-mas (L.) Schott. Occasional among rocks, chiefly limestone.
- 21/2 D. pseudomas (Wollaston) Holub. & Pouzer.
- 21/3 D. abbreviata (DC) Newmn. Occasional in high-level sandstone scree.
- 21/6 D. carthusiana (Villar.) H.P. Fuchs. Frequent in shady places amongst rocks and on blanket peat.
- 21/7 D. dilatata (Hoffm.) A. Gray. Frequent on rocks.
- 21/ D. assimilis S. Walker. Among sandstone scree in Knock Ore Gill, A.C.J. and A.J.R.
- 22/2 Polystichum aculeatum (L.) Roth. Occasional on limestone.
- 22/3 P. lonchitis (L.) Roth. Rare in limestone scree and sink-holes.
- 24/1 Thelypteris limbosperma (All.) H.P. Fuchs. Occasional in acidic grassland at lower levels, and on sandstone.

- 24/3 Thelypteris phegopteris (L.) Slosson. Single locality on whinsill, Force Burn.
- 24/4 T. dryopteris (L.) Slosson. Rare on sandstone. Force Burn, scree in Knock Ore Gill.
- 25/1 Polypodium vulgare L. sensu lato. Occasional on sandstone and whinsill.
- 28/1 Botrychium lunaria (L.) Sw. Occasional in grassland and on mine heaps.
- 29/1 Ophioglossum vulgatum L. Rare, on mine heaps and flushed Nardus grassland near Moor House.
- 34/1 Juniperus communis L. Three bushes at 450 m O.D. on limestone in Swindale.
- 36/1 Caltha palustris L. Frequent in wet places with subsp. minor common at the higher elevations.
- 43/1 Anemone nemorosa L. Present occasionally in limestone grassland. Has flowered prolifically in enclosures, Knock Fell, 730 m. O.D.
- 46/1 Ranunculus acris L. Common in their usual habitats.
- 46/2 R. repens L. Common in their usual habitats.
- 46/10 R. auricomus L. Rare. Moor House meadow. K.T. (1975).
- 46/12 R. flammula L. Common in usual habitats.
- 46/16 R. hederaceus L. Rare, rill at head of Middle Tongue Beck. By Cow Green Reservoir - Moor House boundary, H.G.P.
- 46/17 R. omiophyllus Ten. Occasional in pools and springs.
- 46/22 R. aquatilis L. River Tees, N.T.H.H..
- 46/24 R. ficaria L. Occasional in grassland and among bracken.
- 50/2 Thalictrum alpinum L. Rare on limestone rocks, Knock Ore Gill 725 m O.D. as given in Wilson (1938) and calcareous flush, Troutbeck Head.

- 50/3a) Thalictrum minus L. subsp. minus. Rare on limestone rocks, Swindale 480 m and Nether Hearnth gorge.
- 57/1 Ceratophyllum demersum L.
- 84/4 Thlaspi alpestre L. Common around old lead mine workings.
- 85/1 Teesdalia nudicaulis (L.) R.Br. Not seen recently, but a single plant recorded at source of Tees, Vasculum (1915).
- 86/1 Capsella bursa-pastoris (L.) Medic. In garden/tree nursery at Moor House (1960's).
- 88/1 Cochlearia officinalis L. Middle Tongue, A.J.R.
- 88/2 C. alpina (Bab.) H.C. Wats. Common on limestone and around mine workings and occasional in flushes.
- 94/3 Draba incana L. Occasional on limestone ledges, Green Castle, Middle Tongue, Crowdundale, Swindale.
- 95/1 Erophila verna (L.) Chevall. Rare, on limestone boulders at 420 m O.D. near Dun Fell road.
- 97/1 Cardamine pratensis L. Common in usual habitats.
- 97/4 C. flexuosa With. Common in usual habitats.
- 100/4 Arabis hirsuta (L.) Scop. Frequent, rock ledges of western escarpment of Reserve.
- 102/1 Rorippa nasturtium-officinale (L.) Hayek. Single locality by stream draining Moor House meadow.
- 113/4 Viola riviniana Reichb. Common in usual habitats.
- 113/6 V. canina L. Uncommon, in Knock Ore Gill.
- 113/9 V. palustris L. Common in its usual habitats.
- 113/11 V. lutea Huds. Frequent in limestone grassland.
- 114/1 Polygala vulgaris L. A.J.R.
- 114/2 P. serpyllifolia Hose. Common in grasslands.

- 115/11 Hypericum pulchrum L. On whinsill scree, a single locality, Force Burn.
- 118/1 Helianthemum chamaecistus Mill. Knock Ore Gill, A.J.R..
- 123/13 Silene dioica (L.) Clairv. Middle Tongue Beck at lower levels.
- 124/3 Lychnis flos-cuculi L. Mesotrophic fen with Juncus acutiflorus, at foot of Middle Tongue Beck and in Johnny's Flush (Moss Burn).
- 131/7 Cerastium holosteoides Fries. Common in grasslands.
- 133/2 Stellaria media (L.) Vill. Only on disturbed ground around Moor House and by cattle grid on Dun Fell road.
- 133/7 S. graminea L. In limestone and alluvial grasslands.
- 133/8 S. alsine Grimm. Frequent among Juncus effusus.
- 136/4 Sagina procumbens L. Frequent in Agrostis-Festuca grassland.
- 136/10 S. nodosa (L.) Fenzl. Occasional in flushes and wet grassland.
- 137/1 Minuartia verna (L.) Hiern. Frequent in limestone grassland and on old lead mine waste.
- 141/1 Arenaria serpyllifolia L. On fell wall at western foot of Reserve.
- 149/1 Montia fontana L. Common in springs.
- 154/4 Chenopodium album L. In Middle Tongue limestone, A.J.R..
- 166/4 Linum catharticum L. Frequent in Agrostis-Festuca grasslands.
- 168/2 Geranium sylvaticum L. Occasional in ungrazed grassland, Moor House meadow and rock ledges. Has flowered in Knock Fell enclosure, 735 m O.D.
- 168/13 G. molle L. Growing in Moor House tree nursery.
- 168/15 G. lucidum L. Infrequent, limestone scree, Knock Ore Gill, Eller Gill.
- 168/16 G. robertianum L. Frequent amongst limestone rocks.

- 170/1 Oxalis acetosella L. Common in Agrostis-Festuca grassland in sink-holes.
- 192/2 Trifolium pratense L. Confined to Moor House meadow and by anemometer tower.
- 192/18 T. repens L. Common in grasslands and flushes.
- 195/1 Lotus corniculatus L. Occasional in limestone grassland at lower altitudes.
- 195/3 L. uliginosum Schkuhr. Confined to Juncus acutiflorus flushes, Middle Tongue Beck.
- 206/4 Vicia cracca L. Rare in Agrostis-Festuca grassland, Rough Sike.
- 206/11 V. sepium L. Occasional on little grazed limestone ledges.
- 210/2 Filipendula ulmaria (L.) Maxim. Present in flushes, Moss Burn.
- 211/1 Rubus chamaemorus L. Common on blanket bog. Subject of detailed ecological study by K. Taylor and T. Marks.
- 211/2 R. saxatilis L. Rare, limestone sink-holes, Knock Fell, Green Burn Head.
- 212/2 Potentilla palustris (L.) Scop. Infrequent in flushes at lower altitudes, Little Dodgen Pot Sike but also Great Dun Fell Hush.
- 212/3 P. sterilis (L.) Garcke. In grassland, chiefly at lower levels.
- 212/13 P. erecta (L.) Rausch. Common in all grasslands.
- 215/1 Fragaria vesca L. Occasional in base-rich grassland and amongst limestone.
- 216/3 Geum rivale L. Occasional in flushes and limestone grassland. Ecological studies by K. Taylor.
- 220/3(2) Alchemilla vestita (Buser) Raunk. Frequent, limestone grassland and some flushes.
- 220/3(3) A. filicaulis Buser. Occasional in limestone grassland. Subsp. vestita Buser. M.E. Bradshaw. Frequent in similar grassland. Alchemilla spp. studies by M.E. Bradshaw.

- 220/3(8) Alchemilla xanthochlora Rothm. Only in Moor House meadow.
- 220/3(10) A. glabra Neygenf. Common on limestone and sandstone ledges and in Agrostis-Festuca grassland.
- 220/3(11) A. wichurae (Buser) Stefanss. Occasional on limestone and whinsill, Middle Tongue, Crowdundle.
- 225/13 Rosa villosa L. Rare on limestone ledges, Knock Ore Gill, 430 m O.D., Swindale.
- 226/1 Prunus spinosa L. Only on limestone scarp, Knock Ore Gill, 420 m O.D.
- 229/2 Crataegus monogyna Jacq. Occasional on limestone ledges below 480 m, Knock Ore Gill, Swindale, but seedlings found at 750 m O.D.
- 231/1 Sorbus aucuparia L. About 25 trees and bushes in Knock Ore Gill and Swindale where seedlings are common on suitable sites, but quickly grazed out.
- 235/1 Sedum rosea (L.) Scop. Limestone ledges, abundant on Green Castle, also in Crowdundle.
- 235/8 S. acre L. On limestone, Scar limestone in Crowdundle.
- 235/12 S. villosum L. Frequent in flushes and occasional in alluvial grassland.
- 239/2 Saxifraga stellaris L. Common in flushes and springs.
- 239/3 S. hirculus L. Occasional in flushes, often amongst Juncus effusus.
- 239/15 S. hypnoides L. Frequent in limestone grassland, especially in rocky places.
- 242/1 Chrysosplenium oppositifolium L. Common in springs and wet limestone crevices.
- 242/2 C. alternifolium L. Occasional, similar localities to C. oppositifolium.
- 243/1 Parnassia palustris L. Occasional in wet calcareous grassland, mainly lower down on the western escarpment.

- 247/1 Drosera rotundifolia L. Frequent in wet blanket bog.
Trichophoro-Eriophoretum of Eddy, Welch & Rawes (1969).
- 254/3 Epilobium montanum L. Occasional in limestone sink-holes and on wet ledges.
- 254/10 E. palustre L. Occasional in wet grassland at lower altitudes.
- 254/11 E. anagallidifolium Lam. Frequent in high-level flushes.
- 254/12 E. alsinefolium Vill. Occasional in high-level flushes and wet limestone ledges.
- 254/13 E. nerterioides Cunn. Common on shingle.
- 255/1 Chamaenerion angustifolium (L.) Scop. Occasional on scree and peat. Commonly occurs in exclosures where surface vegetation has been disturbed.
- 258/3 Circaea alpina L. Rare in limestone sink-holes, Knock Fell.
- 262/1 Callitriche stagnalis Scop. Frequent in pools.
- 262/4 C. hamulata Kutz. ex Kah. Frequent in pools.
- 268/1 Hedera helix L. Occasional on limestone at lower levels.
- 269/1 Hydrocotyle vulgaris L. Knock Ore Gill, A.J.R.
- 274/2 Anthriscus sylvestris (L.) Hoffm. Rare on limestone ledges, Middle Tongue, and also on waste ground by Moor House.
- 293/1 Conopodium majus (Goun.) Loret. Occasional in limestone grassland.
- 294/1 Pimpinella saxifraga L. Occasional on limestone ledges between 450 and 480 m O.D. in Swindale.
- 307/1 Angelica sylvestris L. Rare on limestone ledges, Crowdundle, Middle Tongue.
- 311/1 Heracleum sphondylium L. Occasional on limestone ledges, some plants in Moor House meadow.
- 318/1 Mercurialis perennis L. Locality by Corylus bush, Knock Ore Gill.

- 320/1 Polygonum aviculare L. Occasional in flushes, especially at lower elevations.
- 320/5 P. viviparum L. Occasional, but more widespread than first thought, in limestone grassland. Rarely flowers under sheep grazing.
- 325/1 Rumex acetosella L. Common in grassland.
- 325/2 R. acetosa L. Occasional in grassland, chiefly ungrazed meadow.
- 328/2 Urtica dioica L. Frequent around buildings, ruins and in limestone sink-holes.
- 338/1 Corylus avellana L. Rare, limestone scarps at lower levels, Knock Ore Gill, Swindale.
- 343/12b) Salix cinerea ssp. atrocinerea (Brot.) Silva & Sobrinho. Self-sown seedlings occasionally in enclosures and elsewhere.
- 356/1 Calluna vulgaris (L.) Hull. Abundant below 750 m O.D. on east side of Reserve, but almost absent from west side because of grazing. Subject of many research studies.
- 357/1 Erica tetralix L. Frequent in blanket bog.
- 358/1 Vaccinium vitis-idaea L. Frequent in blanket bog and high-level Festuca grassland.
- 358/2 V. myrtillus L. Common throughout Reserve, in bog and grasslands.
- 358/3 V. uliginosum L. Rare, Knock Fell summit, A.J.R..
- 358/4 V. oxycoccus L. Occasional in wet blanket bog, Trichophoro-Eriophoretum, Eddy, Welch & Rawes.
- 364/1 Empetrum hermaphroditum Hagerup. Knock Fell, A.J.R.
- 364/2 E. nigrum L. Common in blanket bog and Festuca grassland.
- 367/1 Primula farinosa L. Single locality on limestone ledges, Rough Sike enclosure. Probably introduced by keepers, and has increased since enclosure.
- 367/3 P. veris L. Moor House meadow (where it has increased), Rough Sike enclosure (to which it has spread) and ungrazed rock ledges, Crowdundle and Green Castle.

- 370/1 Lysimachia nemorum L. Occasional in wet places.
- 384/2 Gentiana verna L. On limestone close to Reserve boundary.
- 385/1 Gentianella campestris (L.) Borner. Single locality on skeletal limestone soil with Sesleria in Knock Ore Gill.
- 385/3 G. amarella (L.) Borner. Occasional in limestone grassland, quarry above Knock Ore Gill, Rough Sike ford, and on mine heaps.
- 386/1 Menyanthes trifoliata L. Infrequent in acidic flushes and pools, southeast of Tees Bridge, Little Dodgen Pot Sike Foot, Force Burn Foot, Troutbeck Head, Great Dun Fell north-facing flush.
- 400/1 Myosotis scorpioides L. Troutbeck, A.J.R.
- 400/2 M. secunda A. Murr. Occasional by streams at lower levels.
- 400/3 M. stolonifera (DC) Gay ex Leresche & Levier. Frequent by rills and in high-level flushes.
- 400/6 M. alpestris Schmidt. Very rare and declining, M.R. (1978).
- 400/8 M. arvensis (L.) Hill. Single locality by Moor House meadow wall.
- 429/1 Digitalis purpurea L. Occasional amongst sandstone and whinsill rocks.
- 430/1 Veronica beccabunga L. By streams and in flushes.
- 430/4 V. scutellata L. Occasional, streamsides and flushes.
- 430/5 V. officinalis L. Frequent in limestone grassland.
- 430/7 V. chamaedrys L. Occasional in limestone grassland.
- 430/13 V. serpyllifolia L. Occasional in flushes and amongst limestone rocks.
- 430/15 V. arvensis L. Occasional in waster places around Moor House.
- 432/2 Pedicularis sylvatica L. Frequent in wet acidic grassland at lower altitudes.
- 433/2 Rhinanthus minor L. Occasional in limestone grassland, common in Moor House meadow.

- 434/3 Melampyrum pratense L. Rare on slopes of blanket bog, Burnt Hill, Green Burn.
- 435/1 Euphrasia micrantha Reichb. Uncommon, species-rich Agrostis-Festuca grassland, Green Castle.
- 435/10 E. curta (Fr.) Wettst. Limestone grassland, Knock Ore Gill. Not recorded recently.
- 435/13 E. nemorosa (Pers.) Wallr. With E. confusa the most common Euphrasia species. Frequent in grassland.
- 435/15 E. confusa Pugsl. Common in Agrostis-Festuca grassland.
- 435/17 a) E. borealis x brevipila. Middle Tongue Flush. Coll. D.W., det. P.F.Y.
- 441/3 Pinguicula vulgaris L. Occasional in flushed open places.
- 448/3 Thymus drucei Ronn. Common, especially in limestone grassland and alluvial areas.
- 457/1 Prunella vulgaris L. Frequent in Agrostis-Festuca grassland.
- 459/6 Stachys palustris L. Rare. Sandstone ledge in Knock Ore Gill, near fell wall, and near buildings at Moor House.
- 471/2 Ajuga reptans L. Rare. Limestone ledge in Knock Ore Gill, 480 m O.D.
- 472/1 Plantago major L. Occasional on base-rich bare soils around Moor House near cattle grid, Dun Fell road.
- 472/3 P. lanceolata L. Frequent particularly in limestone grassland.
- 475/7 Campanula rotundifolia L. Frequent in grassland, up to 740 m O.D.
- 479/1 Jasione montana L. Rare. Limestone grassland by Dun Fell Road, Crowdundle.
- 485/2 Galium boreale L. Occasional. Ledges and sink-holes, limestone and whinsill.
- 485/3 G. mollugo L. Knock Ore Gill. A.J.R.

- 485/4 Galium verum L. Occasional in limestone grassland, seldom above 600 m O.D.
- 485/5 G. saxatile L. Common in all grasslands.
- 485/7 G. sternerii Ehrend. Frequent in limestone grassland.
- 485/8 G. palustre L. Common in flush and mires.
- 493/1 Adoxa moschatellina L. Occasional amongst limestone rocks, Knock Fell, 740 m O.D.
- 495/1 Valeriana officinalis L. Rare on limestone ledges, Middle Tongue Beck, but recorded as common in wet places, up to 720 m O.D., Wilson (1938).
- 495/3 V. dioica L. Occasional in flushes.
- 500/1 Succisa pratensis Moench. Occasional in flushes at lower levels.
- 506/1 Senecio jacobaea L. Occasional in limestone grassland, Rough Sike enclosure, Knock Ore Gill Foot, Green Hole.
- 506/8 S. vulgaris L. Rare. Moor House tree nursery and after cultivation of peat land.
- 508/1 Tussilago farfara L. Frequent on shingle.
- 517/1 Antennaria dioica (L.) Gaertn. Occasional in limestone grassland where soil is shallow. Several populations in Rough Sike grassland.
- 518/1 Solidago virgaurea L. Infrequent. Sandstone and whinsill ledges, Force Burn, Swindale, Crowdundle.
- 524/1 Bellis perennis L. Common in Agrostis-Festuca grassland.
- 528/1 Achillea millefolium L. Common in grasslands.
- 528/2 A. ptarmica L. Common in alluvial and other Agrostis-Festuca grasslands. Colonises mole hills.
- 532/2 Matricaria matricarioides (Less.) Porter. By fell gate, Dun Fell road.
- 533/2 Leucanthemum vulgare Lam. Middle Tongue, A.J.R.

- 533/4 Tanacetum parthenium (L.) Schultz Bip. Middle Tongue.
- 540/2 Cirsium vulgare (Savi.) Ten. Frequent in limestone grassland below 500 m O.D.
- 540/3 C. palustre (L.) Scop. Widespread in grasslands and flushes.
- 540/4 C. arvense(L.) Scop. Frequent in limestone grassland at lower levels.
- 544/6 Centaurea nigra L. Uncommon. Rock ledges.
- 550/1 Leontodon autumnalis L. Frequent in calcareous flushes.
- 550/2 L. hispidus L. Occasional on limestone ledges, Melmerby Scar limestone in Knock Ore Gill, and occasional in Moor House meadow and Rough Sike enclosure.
- 555/1 Mycelis muralis (L.) Dumort. Rare, amongst limestone rocks, Green Burn Head.
- 556/4 Sonchus asper (L.) Hill. Rare, Moor House meadow and Rough Sike enclosure, L.T.
- 558/1.50 Hieracium cumbriense F.J. Hanb. Scar limestone in Crowdundle and Middle Tongue, P.D. Sell, also Stake Beck Gorge, 570 m.
- 558/1.56 H. ampliatus (W.R. Linton) A. Ley. Frequent on limestone ledges, Great limestone 740 m O.D. in Crowdundle, and Green Castle, Rough Sike.
- 558/1.59 H. anglicum Fries. Common on limestone ledges, occasional on sandstone, 700 m in Middle Tongue Beck.
- 558/1.60 H. iricum Fries. Uncommon. Crowdundle Beck.
- 558/1.86 H. leyi F.J. Handb. Infrequent. Crowdundle Beck.
- 558/1.91 H. sommerfeltii Lindeb. Uncommon. Crowdundle.
- 558/1.118 H. pellucidum Laest. Rock ledges. Crowdundle.
- 558/1.131 H. duriceps F.J. Handb. Limestone ledges. Stake Beck at 570 m O.D.
- 558/1.138 H. pseudostenstroemii Pugs1. Common on limestone ledges.

- 558/1.143 Hieracium crebridentiforme Pugsl. Locally common on limestone. Middle Tongue, 600 m O.D., and whinsill, Swindale, 500 m.
- 558/1.144 H. auratiflorum Pugsl. Only in Swindale on limestone ledges, 450-490 m.
- 558/1.145 H. maculosum (Stenstrom) Omang. Locally common on limestone and whinsill, Knock Ore Gill, 450-500 m.
- 558/1.154 H. silvaticoides Pugsl. Only at 600-625 m on limestone in Middle Tongue Beck.
- 558/1.155 H. oistophyllum Pugsl. Only at 625 m south of Knock Ore Gill and around 620 m on limestone in Middle Tongue Beck and Crowdundle.
- 558/1.162 H. rhomboides (Stenstrom) Johans. Rare. Melmerby Scar limestone in Swindale at 450 m O.D.
- 558/1.183 H. rubiginosum F.J. Hanb. Frequent in Crowdundle.
- 558/1.184 H. vulgatum Fries. Only on whinsill at 550 m in Force Burn Gorge and below 460 m in Knock Ore Gill.
- 558/1.186 H. cravoniense (F.J. Hanb) Roffey. Only at 450 m south of Knock Ore Gill on limestone.
- 558/2 H. pilosella L. Occasional in limestone grassland.
- 559/8 Crepis paludosa (L.) Moench. Occasional in flushed calcareous grassland, also on limestone ledges, Swindale 450 m O.D.
- 560/1 Taraxacum brachyglossum (Dahlst.) Dahlst. Knock Ore Gill, A.J.R.
- 560/3 T. lacistophyllum (Dahlst.) Raunk. Knock Ore Gill, A.J.R.
- 560/17 T. oxoniense Dahlst. Knock Ore Gill, A.J.R.
- 560/20 T. proximum (Dahlst.) Dahlst. Knock Fell, A.J.R.
- 560/33 T. unguilobum Dahlst. Widespread throughout western escarpment, Knock Fell and Troutbeck, A.J.R.
- 560/36 T. faeronse (Dahlst.) Dahlst. Troutbeck, Middle Tongue, Knock Fell, A.J.R.

- 560/43 T. maculigerum H. Lindb. f. Middle Tongue, A.J.R.
- 560/44 T. praestans H. Lindb. f. Middle Tongue and Crowdundle, A.J.R.
- 560/48 T. drucei Dahlst. Knock Ore Gill, A.J.R.
- 574/1 Triglochin palustris L. Occasional in flushes and on shingle.
- 577/2 Potamogeton polygonifolius Pourr. Frequent in pools of acidic water.
- 584/1 Narthecium ossifragum (L.) Huds. Frequent in wet blanket bog.
- 605/1 Juncus squarrosus L. Common on peaty soils. Ecological studies by D. Welch.
- 605/7 J. bufonius L. Rare on shingle, Tees.
- 605/8 J. inflexus L. Wet calcareous ground at lower altitudes.
- 605/9 J. effusus L. Most common rush, characteristically on silty peats by streams and rivers.
- 605/10 J. subuliflorus Drejer. Frequent up to 540 m O.D., chiefly on calcareous drift.
- 605/18 J. acutiflorus Ehrh. ex Hoffm. Common in flushes at lower levels on west side of Reserve.
- 605/19 J. articulatus L. Frequent in flushes.
- 605/22 J. bulbosus L. Occasional in flushes and springs.
- 605/22 a) J. kochii F.W. Schultz. Occasional in flushes, A.J.R.
- 605/26 J. triglumis L. Occasional in flushes, Little Dun Fell, Middle Tongue, Knock Ore Gill.
- 606/3 Luzula sylvatica (Huds.) Gaudin. Restricted to sandstone ledge in Knock Ore Gill, near to fell wall, and Crowdundle.
- 606/8 L. campestris (L.) D.C. Common in Agrostis-Festuca grassland and bracken at foot of western escarpment.
- 606/9 L. multiflora (Retz.) Lejeune. Common in all grasslands.

- 614/1 Narcissus pseudonarcissus L. A.J.R.
- 616/4 Iris pseudocorus L. Troutbeck, A.J.R.
- 628/1 Listera ovata (L.) R. Br. Small colony in flush, Knock Ore Gill, and in Rough Sike and Moor House meadow.
- 628/2 L. cordata (L.) R. Br. Frequent in typical blanket bog.
- 635/1 Coeloglossum viride (L.) Hartm. Rare in damp limestone grassland at lower levels, Knock Ore Gill near fell wall.
- 642/7 Orchis mascula (L.) L. Self introduced, Rough Sike enclosure 1976 and since, M.R.
- 643/2 b) Dactylorhiza maculata subsp. ericetorum (E.F. Linton) Hunt & Summerh. Occasional in mesotrophic flushes and species-rich Nardus grassland.
- 650/3 Lemna minor L. Single locality in shallow standing water in flush south of Middle Tongue Beck, 420 m O.D.
- 652/3 Sparganium angustifolium Michx. River Tees, N.T.H.H.
- 654/1 Eriophorum angustifolium Honck. Common in blanket bog and occasional in mesotrophic flushes.
- 654/4 E. vaginatum L. Common in blanket bog. Subject of ecological researches.
- 655/2 Scirpus cespitosus L. Frequent in wet blanket bog and occasional in acidic grasslands.
- 663/4 Carex hostiana DC. A.J.R.
- 663/7 C. lepidocarpa Tausch. Occasional in calcareous flushes.
- 663/7 b) C. lepidocarpa subsp. scotica E.W. Davies. Rare, high-level flushes, A.J.R.
- 663/8 C. demissa Hornem. Frequent in flushes and on irrigated gley soils.
- 663/16 C. rostrata Stokes. Common on soligenous peat.
- 663/24 C. pallescens L. Rare, whinsill ledges, Force Burn.

- 663/26 C. panicea L. Frequent in calcareous grassland.
- 663/28 C. limosa L. Rare, single locality in eutrophic fen, on organic mud, Tees, south of Green Burn.
- 663/29 C. paupercula Michx. Occasional, wet bog, Valley Bog, Moor House pasture.
- 663/31 C. flacca Schreb. Frequent in calcareous flushes and grassland.
- 663/34 C. pilulifera L. Occasional in alluvial grassland below 600 m O.D.
- 663/36 C. caryophyllea Latourr. Frequent in species-rich Agrostis-Festuca grassland.
- 663/50 C. nigra (L.) Reichard. Common in wet acidic grassland and flushes.
- 663/52 C. bigelowii Torr ex. Schwein. Common in grassland and on shallow peat above 630 m O.D.
- 663/70 C. echinata Murr. Common in recolonising peat areas.
- 663/72 C. curta Gooden. Frequent in eroding blanket bog-complexes.
- 663/74 C. ovalis Gooden. Frequent on flushed slopes, usually on gley soils.
- 663/80 C. pulicaris L. Common in all grasslands.
- 663/81 C. dioica L. Occasional in calcareous flushes, Moss Burn.
- 667/1 Molinia caerulea (L.) Moench. Rare, by Tees in wet alluvial Nardus grassland, Moss Burn. Used in experiments 1954-60 at Burnt Hill, Nether Hearth and Force Burn, and although steps taken to eliminate, these are potential sources of spread.
- 668/1 Sieglingia decumbens (L.) Bernh. Frequent in grasslands at lower elevations.
- 669/1 Glyceria fluitans (L.) R. Br. Occasional in marshes and flushes.
- a) G. x pedicellata Townsend. Rare, marsh near Tees Bridge.
- 670/1 Festuca pratensis Huds. Restricted to Moor House meadow.

- 670/6 Festuca rubra L. Common in species-rich Agrostis-Festuca grassland.
- 670/8 F. ovina L. Common in all grasslands.
- 670/10 F. vivipara (L.) Sm. Frequent in grasslands and old lead mine workings.
- 671/1 Lolium perenne L. Single locality in Moor House meadow.
- 676/1 Poa annua L. Occasional, tracks and sheep night camping sites in grassland, frequent in running water flushes.
- 676/4 P. alpina L. Rare, Crowdundle, A.J.R.
- 676/8 P. balfourii Parnell. Rare, Crowdundle, A.J.R.
- 676/12 P. subcaerulea Sm. Frequent in limestone grassland, D.M. Barling.
- 676/13 P. trivialis L. Occasional in calcareous flushes and on limestone ledges, common in Moor House meadow.
- 678/1 Dactylis glomerata L. Single locality in Moor House meadow.
- 679/1 Cynosurus cristatus L. Frequent in limestone grassland below 600 m O.D.
- 680/1 Briza media L. Occasional in limestone grassland at lower levels.
- 681/1 Melica uniflora Retz. Rare on rock ledge, Crowdundle, A.J.R.
- 682/1 Sesleria caerulea (L.) Ard. Frequent on skeletal limestone soils.
- 683/10 Bromus mollis L. Green Castle, A.J.R.
- 689/1 Koeleria cristatus (L.) Pers. Occasional on limestone grassland.
- 693/1 Helictotrichon pratense (L.) Pilg. Rare, limestone ledges, Knock Ore Gill (Melmerby Scar), Green Castle.
- 693/2 H. pubescens (Huds.) Pilg. Rare, limestone grassland, Moss Burn Head, but abundant, Moor House meadow.
- 695/1 Holcus lanatus L. Frequent at lower altitudes, alluvial grassland and well drained slopes.

- 695/2 Holcus mollis L. Occasional in limestone grassland.
- 696/1 Deschampsia cespitosa (L.) Beauv. Common in grassland, especially species-rich Agrostis-Festuca.
- 696/2 D. flexuosa (L.) Trin. Common throughout Reserve in acidic grasslands.
- 697/1 Aira praecox L. Occasional in alluvial grassland at lower levels.
- 701/2 Agrostis canina L. Common, particularly in species-poor grasslands.
- 701/3 A. tenuis Sibth. Common in all grasslands.
- 701/5 A. stolonifera L. Frequent in flushes and wet grasslands.
- 707/5 Phleum alpinum L. Outside Reserve boundary. Single locality.
- 708/2 Alopecurus pratensis L. Restricted to Moor House meadow and pasture. Hay importation.
- 708/6 A. alpinus Sm. Rare, calcareous flushes.
- 712/1 Anthoxanthum odoratum L. Common, grasslands, more particularly species-rich Agrostis-Festuca.
- 715/1 Nardus stricta L. Common on acidic soils.

B. BRYOPHYTA

1. Mosses

Order and nomenclature follow A.J.E. Smith, 1978.

- 1.1 Sphagnum imbricatum Hornsch. ex. Russ. Rare in wet bog, Tees near Little Dodgen Pot Sike and north of Hard Hill, 660 m O.D.
- 1.2 S. papillosum Lindb. Common around pools in blanket bog.
- 1.3 S. palustre L. Oligotrophic mires, e.g. Sphagneto-Juncetum effusi; acid Carex mires, streamsides.
- 1.4 S. magellanicum Brid. Frequent in wet bogs.
- 1.5 S. squarrosum Crome, Samml. Frequent in acid soligenous peat, especially in Sphagneto-Juncetum effusi, see Eddy, Welch and Rawes (1969).
- 1.6 S. teres (Schimp) Angstr. Occasional, on slightly flushed peat, mainly on streamsides and margins of flushes.
- 1.7 S. fimbriatum Wils. Occasional in Sphagneto-Juncetum effusi.
- 1.8 S. girgensohnii Russ. Occasional in Sphagneto-Juncetum effusi and on wet banks, Middle Tongue Beck 700 m, east of Knock Fell, 600 m.
- 1.9 S. russowii Warnst. Occasional in Sphagneto-Juncetum effusi and edges of blanket bog. East of Knock Fell, 720 m.
- 1.10 S. quinquefarium (Braithw.) Warnst. Occasional, on wet rocks, sandstone scree, Knock Ore Gill, 540 m.
- 1.11 S. warnstorffii Russ. Rare, mesotrophic flushes, irrigated limestone pavement, north-east of Hard Hill, 570 m. Moss Burn - Rough Sike area, A.J.R.
- 1.12 S. capillifolium (Ehrh.) Hedw. Common in blanket peat throughout the Reserve.

- 1.13 S. fuscum (Schimp.) Klinggr. Rare, drier parts of blanket bog and erosion areas, House Hill, north of Troutbeck, 570 m. Near Swath Beck and Moss Burn, A.J.R.
- 1.14 S. subnitens Russ and Warnst. Frequent in hollows on bogs; wet hill slopes.
- 1.17 S. compactum DC. Rare, Force Burn, on thin peat over whinsill. East of Great Dun Fell, A.J.R.
- 1.19 a) S. auriculatum var. auriculatum Schimp. Common in soligenous mires, valley bogs, Carex rostrata fens, Sphagneto-Caricetum alpinum, Eddy, Welch and Rawes, and wet rocks.
- b) S. auriculatum var. inundatum (Russ.) M.O. Hill. Occasional in slightly basic flushes; streamsides, mainly in limestone areas.
- 1.22 S. ouspidatum Hoffm. Common in pools in blanket bog.
- 1.24 S. tenellum (Brid.) Brid. Frequent in wet bogs.
- 1.26 S. pulchrum (Braithw.) Warnst. Single locality, in blanket bog on Meldon, near Mattergill Sike, 540 m O.D.; requires confirmation.
- 1.27 S. recurvum P. Beauv. Common in recolonising areas of eroding bog and on soligenous peat.
- 2.1 Andreaea alpina Hedw. Frequent on whinsill.
- 2.3 A. rupestris Hedw. Frequent on whinsill and sandstone.
- 2.4 A. rothii Web. and Mohr. Single locality, Crowdundle Head, 610 m, on whinsill.
- 3.1 Tetraphis pellucida Hedw. Occasional on sides of peat gullies, Moss Flats.
- 5.1 Polytrichum alpinum Hedw. Frequent in acidic grassland, common in limestone grassland.
- 5.2 P. longisetum Sw. ox. Brid. Occasional in bog and grassland.
- 5.3 P. formosum Hedw. Occasional in drier Calluna bog and sandstone scree.

- 5.4 P. commune Hedw. Common in bog and acidic grassland.
- 5.6 P. piliferum Hedw. Frequent on exposed drift, shingle and limestone grassland.
- 5.7 P. juniperinum Hedw. Common in grassland.
- 5.8 P. alpestre Hoppe. Frequent in bog and grassland.
- 6.2 Pogonatum aloides (Hedw.) P. Beauv. Frequent on exposed drift and shingle.
- 6.3 P. urnigerum (Hedw.) P. Beauv. Frequent in limestone grassland.
- 7.1 Oligotrichum hercynicum (Hedw.) Lam. Cand. Occasional in mixed scree-drift, Eller Gill, 570 m. East of Great Dun Fell and Moss Burn - Rough Sike area, A.J.R.
- 8.3 Atrichum undulatum (Hedw.) P. Beauv. Common in acidic grasslands.
- 9.1 Diphyscium foliosum (Hedw.) Mohr. Rare, rock ledges, Knock Ore Gill, 600 m.
- 12.1 Pleuridium acuminatum Lindb. Occasional in limestone grassland and on limestone walls.
- 12.2 P. subulatum (Hedw.) Lindb. Rare on damp ground near Moor House according to Wilson (1938) but not recently confirmed.
- 14.2 Ditrichum flexicaule (Schimp.) Hampe. Frequent in calcareous grassland.
- 14.4 D. heteromallum (Hedw.) Britt. Rare on acid streamside gravels and clays. Knock Ore Gill.
- 15.1 Distichium capillaceum (Hedw.) Br. Eur. Occasional in limestone grassland and on limestone rocks.
- 17.1 Brachydontium trichodes (Web.) Milde. Single locality, Tees Head on wet sandstone.
- 18.1 Seligeria donniana (Sm.) C. Mull. Rare, on rocks, Wilson (1938) gives two localities, near Moss Burn, Moor House, and Knock Fell, but only the latter has been confirmed.

- 18.2 S. pusilla (Hedw.) Br. Eur. Occasional on limestone in damp crevices, Rough Sike Gorge.
- 18.8 S. recurvata (Hedw.) Br. Eur. Rare on sandstone, Tees Head.
- 19.1 Blindia acuta (Hedw.) Br. Eur. Frequent in wet places, including rocks, flushes and alluvium.
- 21.1 Ceratodon purpureus (Hedw.) Brid. Frequent on bare peat.
- 23.2 Rhabdoweisia crispata (With.) Lindb. Very rare, in clefts of sandstone scree, Eller Gill, 630 m.
- 25.1 Oncophorus virens (Hedw.) Brid. Locally frequent in calcareous flushes. Moss Burn Flush, below Nine Wells, Knock Ore Gill, 690 m, Little Dun Fell.
- 26.1 Dichodontium pellucidum (Hedw.) Schimp. Frequent by streams.
- 26.2 D. flavescens (With.) Lindb. Frequent by streams. In and by Tees, N.T.H.H.
- 28.1 Dicranella palustris (Dicks.) Crundw. ex. Warb. Frequent in oligotrophic flushes and margins of mesotrophic flushes.
- 28.2 D. schreberana (Hedw.) Dix. Occasional in flushes, also wet places in sandstone scree, Tees Head, 660 m. Moss Burn Head, A.J.R.
- 28.7 D. varia (Hedw.) Schimp. Occasional in calcareous grassland and mine heaps. On the banks of the Tees, N.T.H.H.
- 28.9 D. cerviculata (Hedw.) Schimp. Occasional on bare peat faces in eroding bog.
- 28.10 D. heteromalla (Hedw.) Schimp. Frequent in bare places on acidic soils and in sandstone scree.
- 29.1 Dicranoweisia cirrata (Hedw.) Milde. More common in lowland situations on rocks and walls.
- 29.2 D. crispula (Hedw.) Milde. Sandstone slabs by small tarn, Knock Fell.
- 31.2 Kiaeria blyttii (Schimp.) Broth. Cross Fell, boulder scree. North facing at 2700 ft., 696349, R.W.M.C.

- 31.3 K. starkei (Web. and Mohr) Hagen. Crowdundle, but outside Reserve, A.J.R.
- 32.3 Dicranum bonjeanii De Not. Occasional in limestone grassland, Knock Fell, 720 m.
- 32.5 D. scoparium Hedw. Common in acidic grassland and on peat. A. Eddy says - "In spite of the findings of Briggs, as adopted by Smith, I think var. spadiceum (as represented at Moor House) is a good ecological variant or even subspecies. All the material from hummocky blanket peat that I have seen belongs to it. Var. scoparium occurs in screes, grasslands, but is absent from the high altitude bogs!
- 32.6 D. majus Sm. Occasional in acidic grassland. In Nardus grassland near head of Middle Tongue Beck.
- 32.9 D. fuscescens Sm. Frequent in acidic grasslands and dry places, especially at the highest levels.
- 33.4 Dicranodontium denudatum var. alpinum (Schimp.) Hagen. Occasional in acidic grassland and crevices in sandstone scree.
- 34.4 Campylopus fragilis (Brid.) Br. Eur. Occasional in humus pockets in sandstone and limestone scree. Blea Crag.
- 34.5 C. pyriformis (Schultz) Brid. Frequent on peat, in erosion areas and on sandstone scree.
- 34.6 C. paradoxus Wils. Common on bare peat and in Eriophoretum, see Eddy, Welch and Rawes, also in bare areas of acidic grasslands.
- a) C. paradoxus var. zonatus (Mol.) Anzi. Occurs in similar situations.
- 34.9 C. atrovirens De Not. Very rare, on soligenous peat, Middle Tongue Foot, 480 m.
- 34.11 C. introflexus (Hedw.) Brid. Rare, in blanket bog, Bog End.
- 36.1 Leucobryum glaucum (Hedw.) Angstr. Uncommon, blanket bog erosion areas, often amongst Sphagnum, Rough Sike, 600 m, House Hill, also in limestone grassland, Knock Ore Gill, 390 m.
- 37.2 Fissidens viridulus (Sw.) Wahlenb. Single locality, roof of cave, Rough Sike limestone gorge.

- 37.4 F. bryoides Hedw. Rare in limestone grassland. Swath Beck, A.J.R.
- 37.13 F. osmundoides Hedw. Occasional in flushes and limestone rocks.
- 37.14 F. taxifolius Hedw. Occasional on limestone rocks and grassland.
- 37.15 F. cristatus Wils. ex Mitt. Occasional in limestone rocks and grassland.
- 37.16 F. adianthoides Hedw. Common in calcareous flushes, occasional in limestone grassland.
- 39.2 Encalypta vulgaris Hedw. Very rare, on limestone, Moss Burn, 600 m, also Crowdundle, A.J.R.
- 39.4 E. rhapsodocarpa Schwaegr. Wilson's 1938 record on limestone cliffs at head of Knock Ore Gill confirmed in 1968 by H.J.B. Birks and by G.W.H. Moule (1977).
- 39.5 E. streptocarpa Hedw. Frequent in limestone grassland and on limestone.
- 40.3 Tortula intermedia (Brid.) De Not. Rare, on limestone, Knock Ore Gill, 480 m.
- 40.8 T. muralis Hedw. Occasional on limestone, also on stone wall at Moor House.
- 40.10 T. subulata Hedw. Frequent on limestone, also on stone wall at Moor House.
- 49.1 Barbula convoluta Hedw. Rare, bare calcareous ground, mostly in spoil heaps, Nether Hearth. Knock Ore Gill, A.J.R.
- 49.2 B. unguiculata Hedw. Occasional on limestone.
- b) B. unguiculata var. cuspidata (Schultz) Brid. Rare, on silt by Knock Ore Gill, 570 m.
- 49.4 B. revoluta Brid. Rare, on bare calcareous ground, in grassland and spoil heaps, Crowdundle, 480 m.
- 49.7 B. fallax Hedw. Occasional, in calcareous grassland, Nether Hearth Sike, 540 m, also Knock Ore Gill and Troutbeck.

- 49.8 B. reflexa (Brid.) Brid. Occasional in limestone grassland, Moss Burn, 600 m. An old record of Wilson (1938) for head of Knock Ore Gill has been confirmed.
- 49.10 B. spadicea (Mitt.) Braithw. Rare, on silt and rocks by streams and rivers, Tees, 540 m and lower, N.T.H.H.
- 49.14 B. rigidula (Hedw.) Mitt. Occasional on limestone.
- 49.16 B. trifaria (Hedw.) Mitt. Crowdundle, A.J.R.
- 49.18 B. tophacea (Brid.) Mitt. Rare, on wet limestone, Knock Ore Gill, 450 m.
- 49.19 B. vinealis Brid. Single locality, mortar of Moor House.
- 49.20 B. cylindrica (Tayl.) Schimp. Very rare, on skeletal limestone grasslands, Knock Ore Gill, c. 420 m, but also by River Tees, N.T.H.H. (1976).
- 49.21 B. recurvirostra (Hedw.) Dix. Common on limestone rocks, mine heaps and shingle grassland.
- 49.22 B. ferruginascens Stirt. Occasional on calcareous grassland.
- 50.2 Gymnostomum aeruginosum Sm. Occasional on wet limestone and in flushes.
- 50.3 G. recurvirostrum Hedw. Very rare, in calcareous flushes, Tufa flush west of Knock Fell, 690 m.
- 52.1 Anoetangium aestivum (Hedw.) Mitt. Very rare, Knock Ore Gill, 600 m, on wet rocks, also Crowdundle.
- 54.1 Weissia controversa Hedw. Occasional on sandy soil by streams and in limestone crevices and mine waste.
- 54.6 W. microstoma (Hedw.) C. Mull. Rare on limestone grassland, frequent among limestone rocks.
- 55.2 Oxystegus tenuirostris (Hook and Taylor). Very rare, Crowdundle Beck, 660 m, on wet sandstone.
- 56.1 Trichostomum crispulum Bruch. Only seen on wall of Moor House but recorded in Knock Ore Gill by Wilson (1938).

- 56.2 T. brachydontium Bruch. Rare, on calcareous silt by streams, Swindale Beck, 540 m.
- 57.2 Tortella tortuosa (Hedw.) Limpr. Common, on limestone and frequent in limestone grassland.
- 57.8 T. nitida (Lindb.) Broth. Rare, on limestone and base-rich grassland. Green Castle, alluvial grassland, Troutbeck Foot.
- 60.1 Leptodontium flexifolium (With.) Hampe. Very rare, in sandstone scree, Blea Crag.
- 61.1 Cinclidotus fontinaloides (Hedw.) Beauv. Rare, running water, Nether Hearth Sike Gorge, also upper Knock Ore Gill and Moss Burn, A.J.R.
- 63.2 Schistidium alpicola var. rivulare (Brid.) Limpr. Occasional on rocks in streams, Force Burn, Nether Hearth Sike, near Moor House.
- 63.3 S. agassizii Sull. and Lesq. In and on banks of Tees, N.T.H.H. and B.A. Whitton.
- 63.4 S. apocarpum (Hedw.) Br. Eur. Frequent on rocks, especially limestone.
- 63.8 S. trichodon (Brid.) Poelt. Single locality, Green Castle on dry limestone crags facing south east.
- 64.6 Grimmia donniana Sm. Very rare, on sandstone, Little Dun Fell, Rough Sike.
- 64.12 G. incurva Schwaegr. Very rare, on sandstone, Little Dun Fell, 780 m.
- 64.13 G. pulvinata (Hedw.) Sm. Occasional on sandstone boulders, Moss Burn 630 m, and in acidic grassland, quarry above Knock Ore Gill.
- 64.15 G. torquata Hornsch. in Grev. Crowdundle, A.J.R.
- 64.16 G. funalis (Schwaegr.) Br. Eur. Crowdundle, A.J.R.
- 64.17 G. trichophylla Grev. Very rare, on sandstone, Middle Tongue Foot.
- 65.1 Dryptodon patens (Hedw.) Brid. Very rare, on whinsill, Knock Ore Gill, 570 m.

- 66.2 Racomitrium aciculare (Hedw.) Brid. Frequent on shingle and rocks by streams.
- 66.3 R. aquaticum (Schrad.) Brid. Locally frequent on wet rocks, Force Burn Gorge, Swath Beck, Tees and Troutbeck.
- 66.4 R. fasciculare (Hedw.) Brid. Frequent on whinsill, occasional on sandstone in scree and on mine heaps.
- 66.5 R. heterostichum (Hedw.) Brid. Frequent on whinsill, occasional on sandstone, in scree and mine heaps.
- 66.6 R. affine (Web. and Mohr) Lindb. Present in similar situations.
- 66.8 R. lanuginosum (Hedw.) Brid. Abundant on sandstone at higher altitudes, also present in dry grasslands and drier parts of blanket bog.
- 66.9 R. canescens (Hedw.) Brid. Common in dry grassland, frequent in shingle and on mine heaps. Most, if not all records are of var. ericoides.
- 67.1 Ptychomitrium polyplyllum (Sw.) Br. Eur. Single locality, by Crowdundle Beck, 600 m, on sandstone.
- 71.1 Funaria hygrometrica Hedw. Occasional on bare soil in grassland or by streams.
- 71.6 F. obtusa (Hedw.) Lindb. Rare on calcareous drift, Knock Ore Gill, 375 m.
- 78.2 Tetraplodon mnioides (Hedw.) Br. Eur. Occasional on sheep dung.
- 79.1 Aplodon wormskjoldii (Horn.) R. Br. Very rare, on bare wet peat, Knock Fell, 600 m. Cross Fell, A.J.R.
- 80.1 Splachnum sphaericum Hedw. Common, on sheep dung.
- 80.2 S. ampullaceum Hedw. Very rare, on sheep dung and Troutbeck limestone grassland.
- 83.1 Orthodontium lineare Schwaegr. Single locality on disturbed peat of a shooting butt, Hard Hill.
- 84.1 Leptobryum pyriforme (Hedw.) Wils. Occurs rarely and transiently after heather burning and in bared ground around Moor House.

- 85.1 Pohlia elongata Hedw. Rare, between boulders of sandstone scree, Eller Gill, 450 m.
- 85.3 P. cruda (Hedw.) Lindb. Frequent on limestone ledges and in limestone grassland.
- 85.4 P. nutans (Hedw.) Lindb. Frequent on blanket bog, especially in bare places, and in acidic grassland and sandstone scree.
- 85.6 P. drummondii (C. Mull.) Andr. Single locality on a periodically irrigated limestone ledge, 705 m, on Green Castle.
- 85.16 P. carnea (Schimp.) Lindb. Occasional in bare places on base-rich soils, Force Burn Gorge, limestone grassland south of Nine Wells, 720 m.
- 85.17 P. wahlenbergii (Web. and Mohr) Andr. Occasional on wet clay banks and in cold water springs. Var. glacialis, Cross Fell, D.W.; requires confirmation.
- b) P. wahlenbergii var. glacialis (Schleich. ex Brid.) E.F. Warb. Occasional in calcareous springs and flushes.
- 87.1 Plagiobryum zieri (Hedw.) Lindb. Occasional in limestone grassland and in crevices in limestone, Moss Burn, 600 m, Green Castle, Crowdundle.
- 88.1 Anomobryum filiforme (Dicks.) Solms-Laub. Frequent in calcareous grassland and on limestone.
- 89.9 Bryum pallens Sw. Common in grassland, flushes, mine waste, and shingle.
- 89.12 B. weigelii Spreng. Rare in oligotrophic flushes, Hard Hill.
- 89.20 B. capillare Hedw. Frequent in limestone grassland and on limestone.
- 89.28 B. pseudotriquetrum (Hedw.) Schwaegr. Common in calcareous grassland and wet places on limestone ledges and mine heaps.
- b) B. pseudotriquetrum var. bimum (Brid.) Lilj. Present in similar situations.
- 89.30 B. caespiticium Hedw. Single locality, Dun Fell Hush, in mineral debris.

- 89.31 B. alpinum Huds. ex With. Occasional in bare places of limestone grassland. Green Castle, and on whinsill, Force Burn Gorge.
- 89.37 B. bicolor Dicks. Single locality, Dun Fell Hush, in mineral debris.
- 89.41 B. argenteum Hedw. Occasional on roads and mine heaps.
- 89.42 B. erythrocarpum complex. Occasional on walls and spoil heaps.
-50
- 90.1 Rhodobryum roscum (Hedw.) Limpr. Locally frequent in limestone grassland and limestone crevices.
- 91.1 Mnium hornum Hedw. Common in Festuca grassland, rare in Nardus grassland.
- 91.2 M. thomsonii Schimp. Very rare, on limestone, sink-hole on Knock Fell, 735 m.
- 91.4 M. marginatum (With.) P. Beauv. Occasional on limestone and in limestone grassland.
- 91.6 M. stellare Hedw. Single locality, Green Castle, in shaded limestone crevice, 690 m.
- 92.1 Cinclidium stygium Sw. Occasional in calcareous flushes, Moss Burn, Little Dun Fell, 750 m, Green Castle.
- 93.1 Rhizomnium punctatum (Hedw.) Kop. Common in calcareous grassland and limestone crevices, rare in acidic grassland.
- 93.3 R. pseudopunctatum (Br. Eur.) Kop. Frequent in springs and flushes.
- 94.1 Plagiomnium cuspidatum (Hedw.) Kop. Rare, Crowdundle Beck 390 m, on damp sandstone, also Green Castle, Upper Moss Burn, Dodgen Pot Sike, A.J.R.
- 94.3 P. elatum (Br. Eur.) Kop. Frequent in calcareous flushes.
- 94.6 P. undulatum (Hedw.) Kop. Occasional in limestone grassland and frequent on limestone.
- 94.7 P. rostratum (Schr.) Kop. Occasional in calcareous grassland.

- 96.1 Aulacomnium palustre (Hedw.) Schwaegr. Common in blanket bog, and wet acidic grassland.
- 96.3 A. androgynum (Hedw.) Schwaegr. Occasional on fossil wood in blanket peat.
- 98.1 Meesia uliginosa Hedw. Occasional in calcareous flushes, Moss Burn, Little Dun Fell, 750 m, head of Knock Ore Gill.
- 99.1 Amblyodon dealbatus (Hedw.) Br. Eur. Rare, in calcareous flushes, Tufa flush west of Knock Fell, 690 m.
- 102.2 Bartramia pomiformis Hedw. Rare, in limestone crevices, Eller Gill, 560 m.
- 102.4 B. ithyphylla Brid. Rare, in limestone crevices, Rough Sike Gorge.
- 105.5 Philonotis fontana (Hedw.) Brid. Common, in calcareous flushes, occasional in calcareous grassland.
- b) P. fontana var. adpressa (Ferg.) Limpr. Occasional in springs.
- 105.8 P. calcarea (Br. Eur.) Schimp. Frequent in calcareous flushes.
- 106.1 Breutelia chrysocoma (Hedw.) Lindb. Occasional on flushed gley soils, Tees, 540 m, Troutbeck above gorge, and in limestone grassland at 435 m, Crowdundle.
- 108.2 Amphidium mougeotii (Br. Eur.) Schimp. Occasional on sandstone and whinsill, Knock Ore Gill, 560 m.
- 110.7 Orthotrichum rupestre Schleich. ex Schwaegr. Hard Rigg and Moor House area, A.J.R.
- 110.10 O. anomalum Hedw. Occasional on limestone rocks. Rough Sike and Troutbeck Gorge.
- 110.11 O. cupulatum Brid. Moor House area, A.J.R.
- 113.1 Fontinalis antipyretica Hedw. Frequent on rocks in slow flowing streams.
- a) F. antipyretica var. gracilis (Hedw.) Schimp. In similar habitats.
- 113.2 F. squamosa Hedw. Occasional on rocks in fast flowing streams.

- 114.1 Climacium dendroides (Hedw.) Web. and Mohr. Common in calcareous grassland and flushes.
- 116.1 Leucodon sciuroides (Hedw.) Schwaegr. Single locality, north of Knock Ore Gill, 420 m, in limestone scree.
- 117.1 Antitrichia curtispindula (Hedw.) Brid. Single locality, Knock Ore Gill, 450 m, in limestone grassland.
- 118.1 Pterogonium gracile (Hedw.) Sm. Single locality, Knock Ore Gill, 375 m, in mixed scree.
- 121.2 Neckera crispa Hedw. Rare in limestone grassland, occasional on limestone.
- 121.4 N. complanata (Hedw.) Huben. Single locality, Swindale, 560 m, on damp limestone.
- 122.1 Homalia trichomanoides (Hedw.) Br. Eur. Rare, Eller Gill, 390 m, on wet rocks, and also in Swindale, A.J.R.
- 123.1 Thamnobryum alopecurum (Hedw.) Nieuwl. Occasional on wet rocks, entrance to mine by Middle Tongue Beck.
- 124.1 Hookeria lucens (Hedw.) Sm. Very rare, on shaded wet clay, among rocks by Crowdundle Beck, 480 m.
- 131.1 Pseudolskeella catenulata (Brid.) Kindb. Occasional in limestone grassland and on limestone, by Tees, 600 m, Green Castle and Crowdundle.
- 135.1 Heterocladium heteropterum (Bruch ex Schwaegr.) Br. Eur. Single locality, by Crowdundle Beck, 450 m, on wet shaded rocks.
- 136.3 Anomodon viticulosus (Hedw.) Hook and Tayl. Single locality, Knock Ore Gill, 390 m, in limestone scree.
- 137.1 Thuidium abietinum (Hedw.) Br. Eur. Single locality, Knock Ore Gill. 450 m, in limestone scree.
- 137.2 T. tamariscinum (Hedw.) Br. Eur. Common in grassland, especially calcareous.
- 137.3 T. delicatulum (Hedw.) Mitt. Occasional in calcareous flushes, Hard Hill, Nine Wells, and in flushed gleys west of Knock Fell, 560 m.

- 137.4 T. philibertii Limpr. Occasional in calcareous grassland, Rough Sike, 550 m, Green Hole.
- 139.1 Cratoneuron filicinum (Hedw.) Spruce. Common in calcareous flushes and on wet limestone.
- 139.2 C. commutatum (Hedw.) Roth. Common in calcareous flushes and wet limestone.
- b) C. commutatum var. falcatum (Brid.) Monk. Also common.
- 140.1 Campylium stellatum (Hedw.) J. Lange and C. Jens. Frequent in calcareous flushes.
- b) C. stellatum var. protensum (Brid.) Bryhn. Frequent in flushes and flushed gleys.
- 140.3 C. chrysophyllum (Brid.) J. Lange. Occasional in limestone grassland, Rough Sike, 550 m, Green Castle, Knock Ore Gill, around 390 m.
- 141.1 Amblystegium serpens (Hedw.) Br. Eur. Occasional on damp sandstone, Knock Ore Gill, 390 m, and Moor House mine heaps.
- 141.2 A. fluviatile (Hedw.) Br. Eur. Knock Ore Gill, A.J.R.
- 141.7 A. riparium (Hedw.) Br. Eur. Single locality, west of Knock Fell, 330 m, in irrigated grassland.
- 143.1 Drepanocladus aduncus (Hedw.) Warnst. Rare in mesotrophic flushes. At 390 m between Knock Ore Gill and Eller Gill, and Hard Rigg.
- 143.4 D. fluitans (Hedw.) Warnst. Frequent in wet acidic grassland and on wet parts of erosion complexes in blanket bog, also on rocks and in streams.
- 143.5 D. exannulatus (Br. Eur.) Warnst. Frequent in blanket bog, occasional in flushes, but locally common in calcareous springs.
- 143.6 D. revolvens (Sw.) Warnst. Frequent in calcareous flushes and springs.
- 143.8 D. uncinatus (Hedw.) Warnst. Occasional in Festuca grassland.
- 144.1 Hygrohypnum ochraceum (Turn. ex Wils.) Loeske. Frequent on rocks by streams.

- 144.3 H. luridum (Hedw.) Jenn. Frequent on rocks by streams.
- 145.1 Scorpidium scorpioides (Hedw.) Limpr. Common in flushes and springs in a few places, Little Dun Fell, Knock Ore Gill.
- 146.1 Calliergon stramineum (Brid.) Kindb. Common in flushes and on wet acid peat, often in erosion complexes.
- 146.3 C. cordifolium (Hedw.) Kindb. Rare in flushes and flushed gleys, Swath Beck, Knock Ore Gill, Moss Burn.
- 146.4 C. giganteum (Schimp.) Kindb. Occasional in calcareous flushes, Little Dun Fell, 750 m, Moss Burn.
- 146.5 C. sarmentosum (Wahlenb.) Kindb. Locally frequent in mesotrophic flushes, Tees Head, Sphagnum warnstorffii flush on Hard Hill.
- 146.6 C. cuspidatum (Hedw.) Kindb. Common in flushes and flushed gleys, occasional in limestone grassland and on shingle.
- 147.1 Isoetecium myurum Brid. Rare on damp shaded sandstone, Crowdundle, 390 m, Knock Ore Gill screes.
- 147.2 I. myosuroides Brid. Rare on sandstone, Crowdundle Beck, 360 m.
- 149.1 Homalothecium sericeum (Hedw.) Br. Eur. Rare on walls of Moor House meadow also in Knock Ore Gill, A.J.R.
- 149.2 H. lutescens (Hedw.) Robins. Rare, limestone grassland, Green Castle, Knock Ore Gill, 480 m, Hard Hill and around Moor House.
- 149.3 H. nitens (Hedw.) Robins. Single locality, north of Hard Hill, 630 m, in flush.
- 150.1 Brachythecium albicans (Hedw.) Br. Eur. Rare on bare ground by Dun Fell road.
- 150.2 B. glareosum (Spruce) Br. Eur. Frequent, flushed gleys.
- 150.4 B. salebrosum (Web. and Mohr) Br. Eur. Rare on whinsill, Force Burn Gorge.
- 150.6 B. rutabulum (Hedw.) Br. Eur. Occasional in limestone grassland and whinsill scree.

- 150.7 B. rivulare Br. Eur. Frequent in flushes and flushed gleys, and dominant in some high altitude springs.
- 150.11 B. velutinum (Hedw.) Br. Eur. Rare on rocks, limestone boulders, Tees, 560 m.
- 150.12 B. populeum (Hedw.) Br. Eur. Rare on sandstone, Swindale, 570 m.
- 150.13 B. plumosum (Hedw.) Br. Eur. Occasional on rocks in streams, Moss Burn, 560 m, Tees.
- 151.1 Pseudoscleropodium purum (Hedw.) Fleisch. Frequent in dry grassland, especially under bracken.
- 153.1 Cirriphyllum piliferum (Hedw.) Grout. Occasional in base-rich grassland, Rough Sike limestone, Tees alluvium.
- 153.3 C. crassinervium (Tayl.) Loeske and Fleisch. Rare on sandstone, Middle Tongue Beck, 420 m, Knock Ore Gill scree.
- 154.1 Rhynchostegium riparioides (Hedw.) C. Jens. Locally frequent on submerged rocks in streams with considerable base content. All western escarpment becks but also seen in Dodgen Pot Sike, A.J.R.
- 154.3 R. murale (Hedw.) Br. Eur. Occasional on limestone and in limestone grassland, Green Castle, Wall at Moor House.
- 154.4 R. confertum (Dicks.) Br. Eur. Uncommon, base of wall, Moor House, but also recorded for Bog End - Dodgen Pot area, A.J.R.
- 155.5 Eurhynchium praelongum (Hedw.) Br. Eur. Occasional in calcareous grassland and on limestone rocks, especially at the entries of mine levels.
- 156.1 Rhynchostegiella tenella (Dicks.) Limpr. Rare on damp limestone, Knock Ore Gill, 420 m.
- 157.2 Orthothecium intricatum (Hartm.) Br. Eur. Local on damp limestone ledges. Knock Ore Gill, 570 m, near Moss Burn, Green Castle.
- 158.1 Entodon concinnus (De Not.) Paris. Rare in limestone grassland and scree. Knock Ore Gill, 450 m, Hard Hill.
- 159.3 Plagiothecium denticulatum (Hedw.) Br. Eur. Occasional in calcareous grassland. In mixed scree, Middle Tongue, 600 m, springs on Great Dun Fell.

- 159.7 P. platyphyllum Monk. Occasional in high level oligotrophic springs. Great Dun Fell. Also above Tees, north of Sike Hill, on flushed gley.
- 159.10 P. nemorale (Mitt.) Jaeg. First recorded on Knock Fell, 735 m, in limestone sink-hole, but found north of Hard Hill, A.J.R.
- 159.11 P. undulatum (Hedw.) Br. Eur. Common in blanket bog and acidic grasslands.
- 161.1 Isopterygium pulchellum (Hedw.) Jaeg. Rare (or overlooked). Among boulders. North side of Little Dun Fell, A.E. (1978).
- 161.2 I. elegans (Brid.) Lindb. Occasional, sink-hole on Knock Fell, 735 m, Tees, N.T.H.H.
- 168.3 Hypnum cupressiforme Hedw. Common in all grasslands.
- 168.5 H. jutlandicum Holmen and Warncke. Frequent under tall heather on heaths and bogs. (All peat records of H. cupressiforme will belong here).
- 168.8 H. lindbergii Mitt. Rare, on gravelly soils, Swindale Beck, 480 m.
- 170.1 Ctenidium molluscum (Hedw.) Mitt. Common in calcareous grasslands and on limestone rocks.
- 171.1 Hylocomium armoricum (Brid.) Wijk and Marg. Rare, on sandstone rocks by waterfalls, Swindale Beck, Crowdundle Beck, 600 m.
- 172.1 Rhytidium rugosum (Hedw.) Kindb. Rare in calcareous grassland, Rough Sike, south of Knock Ore Gill, 420 m.
- 173.1 Rhytidiadelphus triquetrus (Hedw.) Warnst. Frequent in calcareous grassland.
- 173.2 R. squarrosus (Hedw.) Warnst. Common in grassland.
- 173.4 R. loreus (Hedw.) Warnst. Common in blanket bog and acidic grassland.
- 174.1 Pleurozium schreberi (Brid.) Mitt. Common in acidic grassland and on hummocks in blanket bog.
- 175.4 Hylocomium splendens (Hedw.) Br. Eur. Common in calcareous grassland.

2. Liverworts

The nomenclature and species numbering follow Paton (1965).

- 5/1 Conocephalum conicum (L.) Underw. Rare on damp limestone, near Nine Wells Sike and Moss Burn.
- 7/1 Preissia quadrata (Scop.) Nees. Frequent on limestone, occasional in calcareous grassland.
- 8/1 Marchantia polymorpha L. Occasional in springs and flushes, Knock Fell, Dun Fells, Dodgen Pot, Swindale.
- 8/1 a) M. polymorpha var. aquatica Nees. In springs and flushes, Knock Fell, Dun Fells, Dogen Pot, Swindale. All high altitude plants probably belong to this var.
- 12/2 Riccardia multifida (L.) Gray. Frequent in calcareous grassland; occasional in mesotrophic grassland.
- 12/3 R. sinuata (Dicks.) Trev. Occasional in calcareous flushes. Tufa flush west of Knock Fell. Requires confirmation as it may be a small form of R. pinguis.
- 12/6 R. pinguis (L.) Gray. Common in springs and flushes.
- 14/1 Pellia epiphylla (L.) Corda. Frequent in springs and flushes, also on shingle.
- 14/3 P. neesiana (Gottsche) Limpr. Occasional in peaty flushes and mires; Little Dun Fell.
- 14/4 P. endiviifolia Dicks. Occasional in springs, flushes and flushed gleys.
- 15/1 Metzgeria furcata (L.) Dum. Occasional on walls - fell wall near Knock Ore Gill and in limestone grassland - Knock Ore Gill 420 m.
- 15/3 M. conjugata Lindb. Occasional in limestone scree at low levels. Knock Ore Gill.
- 15/5 M. pubescens (Schrank) Raddi. Occasional in limestone grassland and on limestone ledges. Green Castle.

- 17/2 Moerckia flotoviana (Nees) Schiffn. Very rare in flushes. Nine Wells; Moss Burn Flush.
- 18/1 Blasia pusilla L. On bank of River Tees, N.T.H.H. (1976).
- 27/1 Ptilidium ciliare (L.) Hampe. Common in bog and acidic grassland.
- 28/1 Trichocolea tomentella (Ehrh.) Dum. Very rare on wet, shaded ground. Middle Tongue Beck sandstone.
- 29/1 Blepharostoma trichophyllum (L.) Dum. Frequent in calcareous grassland and on damp limestone.
- 31/2 Lepidozia reptans (L.) Dum. Occasional on peat and in erosion areas.
- 31/4 L. setacea (Weber) Mitt. Common in blanket bog; occasional in wet acidic grassland.
- 33/2 Calypogeia muellerana (Schiffn.) K. Mull. Frequent on wet acidic clay, also on peat.
- 33/3 C. trichomanis (L.) Corda emend. Buch. Thought to have been common in blanket bog and wet acidic grassland, but doubt exists as to whether most records are not C. sphagnicola.
- 33/4 C. fissa (L.) Raddi. Occasional on wet acidic soils and peats.
- 33/5 C. sphagnicola (Arn. and Pers.) Warnst. and Loeske. On blanket bog, Green Burn, Force Burn, A.J.R.
- 33/7 C. arguta Nees and Mont. Sides of peat sikes, Swath Beck area, A.J.R.
- 34/1 Lophozia ventricosa (Dicks.) Dum. Common in blanket bog and acidic grassland.
- 34/3 L. porphyroleuca (Nees) Schiffn. Rare in heather blanket bog. Moss Flats.
- 34/4 L. alpestris var. gelida (Tayl.) MacV. Dwarf form. Crowdundle Coll. R.W.M.C., det. A.E. (1969).
- 34/6 L. excisa (Dicks.) Dum. Swath Beck area, A.J.R.

- 34/9 L. incisa (Schr.) Dum. Rare in species-poor Juncetum squarrosum and on flushed peat. Force Burn at 600 m; Moss Burn at 600 m.
- 35/1 Leiocolea turbinata (Raddi) Buch. Rare in base-rich places. On wet limestone in Knock Ore Gill; in limestone grassland at Green Castle; in a Tufa flush in Knock Ore Gill at 360 m.
- 35/3 L. muelleri (Nees) Jorg. Rare in flushes, springs and flushed gleys.
- 35/4 L. bantriensis (Hook.) Jorg. Frequent in springs and flushes.
- 36/1 Barbilophozia floerkei (Web. and Mohr) Loeske. Common in bog, grassland and scree.
- 36/3 B. attenuata (Mart.) Loeske. Occasional on acidic peat and soil. Knock Fell at 750 m; Wilson (1938) also gives this locality.
- 36/6 B. hatcheri (Evans) Loeske. Frequent in acidic and limestone grassland.
- 36/7 B. lycopodioides (Wallr.) Loeske. Occasional in limestone grassland.
- 36/8 B. barbata (Schmid.) Loeske. Frequent in limestone grassland.
- 37/1 Tritomaria quinqueidentata (Huds.) Buch. Frequent in limestone grassland and on limestone.
- 39/2 Sphenolobus minutus (Schreb.) Steph. Rare on peaty rock ledges. Middle Tongue Beck at 600 m.
- 43/1 Anastrepta orcadensis (Hook.) Schiffn. Very rare in species-poor Juncetum squarrosum, Knock Fell at 765 m, but also in Crowdundle, R.W.M.C. (1969). A.E. explains its rarity in the reduction of heather cover.
- 44/1 Gymnocolea inflata (Huds.) Dum. Frequent in wet parts of blanket bog.
- 46/1 Solenostoma triste (Nees) K. Mull. Occasional in calcareous grassland, in springs and on limestone.
- 46/5 S. cordifolium (Hook.) Steph. Frequent in springs, flushes and on stones in base-rich streams.

- 46/6 S. sphaerocarpum (Hook.) Steph. Recorded at the head of Knock Ore Gill by Wilson (1938), but not seen recently.
- 46/8 S. crenulatum (Sm.) Mitt. Frequent, mainly as var. gracillima sensu Macvicar, on clay by streams. Tees Head; stream draining the valley bog north east of Moor House.
- 47/1 Plectocolea obovata (Nees) Mitt. Rare on wet rocks. In Troutbeck at 540 m on limestone, Middle Tongue Beck.
- 48/1 Nardia compressa (Hook.) Gray. Rare in streams. Force Burn at 1900 feet.
- 48/2 N. scalaris (Schrad.) Gray. Common in acidic grassland.
- 52/11 Marsupella emarginata (Ehrh.) Dum. Occasional on wet whinsill. By River Tees.
- 52/12 M. aquatica (Schrad.) Schiffn. Occasional on wet whinsill. By River Tees.
- 53/2 Gymnomitrium obtusum (Lindb.) Pears. On rocks, Crowdundle, R.W.M.C. (1969).
- 54/1 Mylia taylori (Hook.) Gray. Common in blanket bog.
- 54/2 M. anomala (Hook.) Gray. Common in blanket bog.
- 56/2 Plagiochila asplenoides (L.) Dum. Frequent in limestone grassland and on limestone.
- 56/3 P. spinulosa (Dicks.) Dum. Single locality, in Knock Ore Gill at 480 m, amongst sandstone rocks.
- 57/1 Lophocolea bidentata (L.) Dum. Common in grassland.
- 58/1 Chiloscyphus polyanthos (L.) Corda. Frequent on wet rocks and in flushes and springs; occasional on shingle.
- 58/2 C. pallescens (Ehrh.) Dum. Occasional in flushes. North of Knock Ridge at 630 m.
- 61/1 Saccogyna viticulosa (L.) Dum. Very rare in sandstone scree. Knock Ore Gill.

- 62/4 Cephaloziella rubella (Nees) Warnst. On raw humus. Dodgen Pot area, A.J.R.
- 62/5 C. hampeana (Nees) Schiffn. Lower Green Burn area, A.J.R.
- 62/9 C. starkei (Funck.) Schiffn. On sandstone, probably rare. Knock Fell at 750 m.
- 63/2 Cephalozia bicuspidata (L.) Dum. Common on blanket peat.
- 63/5 C. connivens (Dicks.) Lindb. Occasional in blanket bog, but more frequently in very wet bog with pools.
- 63/7 C. media Lindb. Rare on wet base-rich soils. On silt by Knock Ore Gill at 420 m; flushed bank by River Tees at 495 m.
- 64/2 Cladopodiella fluitans (Nees) Buch. Common in wet blanket bog.
- 65/1 Nowellia curvifolia (Dicks.) Mitt. Hard Hill area, A.J.R.
- 66/1 Odontoschisma sphagni (Dicks.) Dum. Common in wet blanket bog.
- 69/1 Diplophyllum albicans (L.) Dum. Common on bare peat and sandstone scree; occasional in acidic grassland.
- 70/8 Scapania irrigua (Nees) Dum. Rare in springs and flushes and shingle, present in Sphagneto-Juncetum effusi.
- 70/9 S. umbrosa (Schrad.) Dum. Very rare in alluvial grassland. Troutbeck Foot.
- 70/10 S. aequiloba (Schwaegr.) Dum. Rare in flushes. Knock Ridge, south east of Silverband.
- 70/11 S. aspera Bernet. Frequent in limestone grassland; rare in flushes.
- 70/12 S. gracilis (Lindb.) Kaal. Occasional in grassland.
- 70/13 S. nemorea (L.) Grolle. Occasional in acidic and calcareous grassland and flushes.
- 70/16 S. undulata (L.) Dum. Frequent in acidic grassland and flushes; abundant in acid streams.
- 70/17 S. uliginosa (Swartz.) Dum. Rare in springs, north east of Little Dun Fell.

- 70/19 S. subalpina (Nees) Dum. Rare in flushes and flushed gleys. Green Castle; irrigated banks on north side of Troutbeck.
- 70/20 S. compacta (Roth) Dum. Single locality, by River Tees above Lady Vein, in shingle.
- 71/1 Radula complanata (L.) Dum. By River Tees above Lady Vein in shingle and in Eller Gill, seen growing in association with Lejeunea, A.E.
- 73/3 Porella platyphylla (L.) Lindb. Probably rare in limestone grassland, Greatdale at 420 m.
- 75/1 Lejeunea cavifolia (Ehrh.) Lindb. Rare on wet shaded rocks. By waterfall in Middle Tongue Beck at 660 m. Eller Gill.
- 75/2 L. patens Lindb. Single locality, Eller Gill on rock.
- 78/1 Cololejeunea calcarea (Lib.) Schiffn. Rare on limestone. Rough Sike.
- 82/1 Frullania tamarisci (L.) Dum. Frequent on limestone.

C. THALLOPHYTA

1. Lichens

Nomenclature and order are according to James (Lichenologist 3, 95-153 and 12, 1-115). Much of the data is drawn from Eddy, Welch and Rawes (1969) and the long term vegetation recording sites, such as those described in Welch and Rawes, (1964). Additional collectors and identifiers are:-

A.E. (Mr. Eddy), P.W.J. (Mr. James), D.H. (Dr. Horsfield), J.R.L. (Mr. Laundon), M.W.R. (Mr. Read), U.K.D. (Ursula Duncan), B.J.C. (Mr. Coppins) and O.L.G. (Mr. Gilbert).

Acarospora sp. Massal. On limestone, Moor House pasture.

A. glaucocarpa (Ach.) Korb. Melmerby Low Scar 410-470 m., B.J.C. and O.L.G. (1981).

Agonimia tristicula (Nyl.) Zahlbr. Knock Ore Gill, B.J.C. and O.L.G. (1981).

Alectoria nigricans (Ach.) Nyl. On at least two sites on summit of Cross Fell. Coll. R.W.M.C., det. B. Gilbert (1978).

A. pubescens (L.) R.H. Howe. On sandstone, Little Dun Fell. Coll. D.W., det. A.E. and P.W.J. (1965). Common on Cross Fell, R.W.M.C.

Allantoparmelia alpicola (Th. Fr.) Essl. Little Dun Fell on boulder scree, B.J.C. and O.L.G. (1981).

Aspicilia calcarea (L.) Sommerf. Green Castle, B.J.C. and O.L.G. (1981).

A. contorta (Hoffm.) Steiner. Green Castle, B.J.C. and O.L.G. (1981).

Bacidia lignaria (Ach.) Lett. Common on peat.

B. sabuletorum (Schreb.) Lett. On limestone mine heaps in pasture. Also Green Castle, B.J.C. and O.L.G. (1981).

B. subviridescens (Nyl.) Zahlbr. On limestone mine heaps, Troutbeck.

Baeomyces rufus (Huds.) Rebent. Common on limestone among mine workings.

Botrydina vulgaris Breb ex Meneghini. Frequent on blanket peat.

Caloplaca aurantiaca (Lightf.) Th. Fr. On limestone, Green Castle, and mine waste, Troutbeck.

C. chalybaea (Fr.) Mull. Arg. Green Castle, B.J.C. and O.L.G. (1981).

C. citrina (Hoffm.) Th. Fr. Green castle, B.J.C. and O.L.G. (1981).

C. marina Wedd. On peat, Moss Burn. Queried by B.J.C. (1981).

Candelariella vitellina (Hoffm.) Mull. Arg. On whinsill boulders, Tees valley between Force Burn and Mattergill Sike. Det. P.W.J. (1966).

Catillaria lenticularis (Ach.) Th. Fr. Green Castle, B.J.C. and O.L.G. (1981).

Cetraria commixta (Nyl.) Th. Fr. On Cross Fell, close to Reserve. Coll. R.W.M.C., det. Dr. Pauline Topham. Little Dun Fell, B.J.C. and O.L.G. (1981).

C. glauca (L.) Ach. Among heath vegetation, Cross Fell, D.H. (1977).

C. hepatizon (Ach.) Vain. On top of Little Dun Fell and Cross Fell, R.W.M.C. (1976). Recorded in Wilson (1938).

C. islandica (L.) Ach. Common in wide range of habitats.

Cladonia arbuscula (Wallr.) Rabenh. Common.

C. bacillaris Nyl. Found on Little Dun Fell, C.J. (1955) and A.J.R. (1976). Queried by B.J.C. (1981).

C. bellidiflora (Ach.) Schaer. Uncommon, peaty soil between boulders, Little Dun Fell summit. Det. P.W.J. (1966). Sandstone scree, Knock Ore Gill, B.J.C. and O.L.G. (1981).

C. capitata (Michaux.) Spreng. A.J.R. (1976). Queried by B.J.C. (1981).

C. cariosa (Ach.) Spreng. A.J.R. (1976). Queried by B.J.C. (1981).

C. cervicornis (Ach.) Flot. In limestone grassland, A.E., also A.J.R.

C. chlorophaea (Florke ex Sommerf.) Spreng. Common, eroding peat and blanket bog.

C. ciliata Stirton. Little Dun Fell, B.J.C. and O.L.G. (1981).

C. coccifera (L.) Willd. Common, blanket bog and other organic soils, Dun Fells. Conf. E. Dahl (1952).

C. cornuta (L.) Hoffm. Hard Hill burning experiment plots.

C. crispata var. cetrariaeformis (Del. ex Duby) Vain. On peat, blanket bog by Silverband track, 700 m. O.D. Conf. J.L.

C. deformis (L.) Hoffm. Uncommon, on peat, Green Hole. (Doubted by B.J.C. (1981) who says will be C. sulpherina).

C. digitata (L.) Hoffm. Sandst. A.J.R.

C. fimbriata (L.) Fr. Frequent, on peat and in grasslands.

C. floerkeana (Fr.) Sommerf. Common, on peat and rocks.

C. foliacea (Huds.) Willd. Knock Fell summit and Green Burn lead mine. Conf. P.W.J.

C. furcata (Huds.) Schrad. Common, blanket bog and grasslands.

C. furcata subsp. subrangiformis (Sandst.) Hennipm. Green Castle, B.J.C. and O.L.G. (1981).

C. gracilis (L.) Willd. Common, on limestone and peat.

C. impexa Harm. Common throughout Reserve.

C. incrassata Florke. A.J.R. Queried by B.J.C. (1981).

C. luteoalba Wheld. and Wils. On decaying vegetation, blanket bog by Silverband track. Conf. J.R.L.

C. macilenta Hoffm. Little Dun Fell, C.J. (1955) and A.J.R., and on Cross Fell, D.H. (1977).

C. mitis Sandst. A.J.R.

C. papillaria (Ehrh.) Hoffm. Little Dun Fell summit. Coll. D.W., det. A.E. (1964).

C. parasitica (Hoffm.) Hoffm. Knock Fell grassland. Queried by B.J.C. (1981).

- C. pocillum (Ach.) O.J. Rich. Frequent, confined to calcareous soils.
- C. polydactyla (Florke) Spreng. Blanket bog on Cross Fell, C.J. (1955) and D.H. (1977).
- C. portentosa (Dufour) Coem. Little Dun Fell, B.J.C. and O.L.G. (1981).
- C. pyxidata (L.) Hoffm. Common, on peat, mineral soils and rock.
- C. rangiferina (L.) Web. Little Dun Fell, A.J.R. (1975). Queried by B.J.C. (1981).
- C. rangiformis Hoffm. Common in limestone grasslands.
- C. scabriuscula (Del. ex Duby) Leight. Frequent, blanket bog and alluvial grasslands. Det. P.W.J. (1966).
- C. squamosa (Scop.) Hoffm. Common in blanket bog beneath Calluna.
- C. subcervicornis (Vain.) Kernst. In crevices of sandstone scree, Little Dun Fell, and whinsill, Force Burn. Det. P.W.J. (1966).
- C. tenuis (Florke) Harm. Common in blanket bog, and grassland. Det. P.W.J. (1966).
- C. uncialis (L.) Web. One of the most common lichens of blanket bog and grassland.
- C. uncialis subsp. biuncialis (Hoffm.) Choisy. Little Dun Fell, B.J.C. and O.L.G. (1981).
- Coelocaulon aculeatum (Schreber) Link. Little Dun Fell, B.J.C. and O.L.G. (1981).
- C. aculeatum subsp. hispidum (Crombie) D. Hawksw. Little Dun Fell, B.J.C. and O.L.G. (1981).
- Collema auriculatum Hoffm. Green Castle, B.J.C. and O.L.G. (1981).
- C. crispum (Huds.) Web. Common on limestone.
- C. cristatum (L.) Web. On limestone in Troutbeck Gorge, P.W.J. (1966).
- C. renax (Sw.) Ach. Knock Ore Gill, B.J.C. and O.L.G. (1981).

C. tuniforme (Ach.) Ach. On limestone in Agrostis-Festuca (Sesleria rich) grassland, Crowdundle.

C. undulatum Laur. ex Flot. Locally frequent in Knock Ore Gill, B.J.C. and O.L.G. (1981).

Coriscium viride (Ach.) Vain. Common on peat.

Cornicularia aculeata (Schreb.) Ach. Common in grasslands and on sandstone scree.

C. normoerica (Gunn.) Du Rietz. Occurs on rocks on Cross Fell above Kirkland at about 500 m., R.W.M.C. (1970).

Diploschistes muscorum (Scop.) R. Sant. Knock Ore Gill, B.J.C. and O.L.G. (1981).

D. scruposus var. bryophilus (Ach.) Mull. Arg. On moss growing on sandstone boulder, Knock Ore Gill. Coll. M.W.R., det. U.K.D. (1970).

Fuscidea gothoburgensis (Magnusson) V. Wirth & Vezda. Little Dun Fell, boulder scree, B.J.C. and O.L.G. (1981).

Gyalecta jenensis (Batsch.) Zahlbr. On moss growing on mine waste. Green Castle, B.J.C. and O.L.G. (1981).

Haematomma ventosum (L.) Massal. Common on sandstone scree, Great Dun Fell, P.W.J. (1966).

Hymenelia prevostii (Duby) Krempelh. Locally abundant on Green Castle and Knock Ore Gill, B.J.C. and O.L.G. (1981).

Icmadophila ericetorum (L.) Zahlbr. Frequent on bare peat, Moss Burn.

Ionaspis epulotica (Ach.) Th. Fr. Locally abundant on Green Castle and Knock Ore Gill, B.J.C. and O.L.G. (1981).

I. heteromorpha (Krempelh.) Th. Fr. Found with I. epulotica.

Lecanora Ach.

a) Subgenus Lecanora section Aspicilia (Massal) Stiz.

L. calcarea (L.) Sommerf. Limestone, quarry in Knock Ore Gill. Coll. D.W., det. P.W.J. (1966).

L. hoffmannii (Ach.) Mull. Arg. Limestone, quarry in Knock Ore Gill. Coll. D.W., det P.W.J. (1966).

b) Section Lecanora

L. conizaeoides Nyl. ex Cromb. In heath vegetation, Cross Fell, D.H. (1977).

L. crenulata (Dicks.) Hook. Found in limestone quarry, Knock Ore Gill. Coll. D.W., det. P.W.J. (1966).

L. dispersa (Pers.) Sommerf. Common, both on sandstone and limestone. Coll. D.W., det. P.W.J. (1966).

L. intricata (Ach.) Ach. Common on sandstone rocks, mine heaps, Dun Fell Hush.

L. intumescens (Rebent.) Rabenh. A.J.R. (1975).

L. polytropa (Hoffm.) Rabenh. Common on sandstone, found on scree, Moss Burn Head and Little Dun Fell. Coll. C.J., det. P.W.J. (1966).

Lecidea Ach.

a) Section Lecidea

L. aglaea Sommerf. A.J.R.

L. albosuffusa (Nyl.) Th. Fr. Crowdundle, limestone grassland at 420 m, J.R.L.

L. coarctata (Sm.) Nyl. Common on limestone and sandstone rocks, old mine heaps, scree and shingle.

L. crustulata (Ach.) Spreng. On sandstone rocks at Silverband and limestone at Green Burn Mine.

L. cyathoides (Ach.) Ach. Abundant on rocks, chiefly sandstone.

L. dicksonii (J.F. Gmel.) Ach. Common on sandstone - Knock Quarry and Dun Fell Hush, P.R.J. (1966).

L. gelatinosa Florke. Little Dun Fell, B.J.C. and O.L.G. (1981).

L. granulosa (Hoffm.) Ach. Common on mineral soils, peat and rocks, 6932, 7030, A.J.R.

L. insularis Nyl. Little Dun Fell, but not confirmed.

L. kochiana Hepp. Common on sandstone rocks on Hard Hill and Little Dun Fell, P.R.J. (1966).

L. lapicida (Ach.) Ach. Mineralised rock, Dun Fell Hush. Also Knock Quarry, P.R.J. (1966).

L. leucophaea (Florke ex Rabenh.) Nyl. On whinsill in Knock Ore Gill, P.W.J. Heathland, Cross Fell, D.H. (1977).

L. lithophila (Ach.) Ach. On sandstone rock on Little Dun Fell, shingle by Tees, and whinsill in Knock Ore Gill, D.W., P.R.J. (1966).

L. macrocarpa (DC.) Steud. Common on sandstone rocks on Little Dun Fell, and Cross Fell, D.H.

L. monticola (Ach.) Schaerer. Green Castle, B.J.C. and O.L.G. (1981).

L. speirea (Ach.) Ach. Frequent on limestone rocks.

L. templetonii T. Tayl. Common on peat.

L. tenebrosa Flot. Common on all rocks, Middle Tongue, P.W.J. (1966).

L. tumida Massal. On limestone on mine heaps in Troutbeck and sandstone in Dun Fell Hush.

L. turgidula Fr. A.J.R.

L. uliginosa (Schrader.) Ach. Little Dun Fell, B.J.C. and O.L.G. (1981).

Lecidella stigmatea Ach. Green Castle, B.J.C. and O.L.G. (1981).

Lepraria crassissima (Hue) Lettau. Knock Ore Gill, B.J.C. and O.L.G. (1981).

L. incana (L.) Ach. On blanket bog, Cross Fell, D.H. (1977).

Leptogium lichenoides (L.) Zahlbr. Rare on mossy limestone, Knock Ore Gill, 430 m., O.D.

L. sinuatum (Huds.) Massal. Green Castle, B.J.C. and O.L.G. (1981).

Micarea lignaria (Ach.) Hedl. Little Dun Fell, B.J.C. and O.L.G. (1981).

Ochrolechia frigida (Sw.) Lynge. Cross Fell, D.H. (1977). Also Little Dun Fell, B.J.C. and O.L.G. (1981).

O. tartarea (L.) Massal. On limestone spoil at Green Burn Mine, P.R.J. (1966).

Opegrapha saxatilis DC. On limestone in pasture mine heap.

O. saxicola Ach. Knock Ore Gill, B.J.C. and O.L.G. (1981).

Pannaria pezizoides (Web.) Trevis. On polluted (zinc and lead) soil in Moor House pasture mine waste, and in grassland, Rough Sike.

Parmelia Ach. nom. cons.

a) Subgenus Hypogymnia Nyl.

P. intestiniformis (Villars.) Ach. On rock mine heaps near house.

P. physodes (L.) Ach. Ubiquitous on sandstone, abundant on Little Dun Fell, and on Calluna wood.

P. tubulosa (Schaer.) Bitt. Common on limestone and sandstone.

b) Subgenus Parmelia

P. alpicola Th. Fr. Found in considerable quantity on summit of Little Dun Fell (Swinscow), Cross Fell, D.H. (1977); at 750 m. on Cross Fell, R.W.M.C. and D.H. (1977) and 675 m. on Hilton Fell, R.W.M.C. (1977).

P. furfuracea (L.) Ach. Frequent on Moor House meadow wall, P.W.J., and on sandstone, Moss Burn, Cross Fell, D.H. (1977).

P. incurva (Pers.) Fr. Frequent on sandstone scree, Little Dun Fell summit, Knock Old Man, Knock Ore Gill below Silverband track, P.W.J. (1966) and on highest rocks of Cross Fell, R.W.M.C. (1976).

P. omphalodes (L.) Ach. On rocks, Hard Hill and Cross Fell, D.H. (1977).

P. saxatilis (L.) Ach. Abundant on sandstone rocks, Little Dun Fell and Hard Hill.

Parmeliopsis ambigua (Wulf.) Nyl. On sandstone scree at Moss Burn Head, P.R.J. (1966), Cross Fell, in heath vegetation, D.H. (1977) and on the highest rocks, R.W.M.C. (1976).

Peltigera apthosa (L.) Willd. Common on base-rich soils in grassland and rock crevices.

P. canina (L.) Willd. Common.

P. horizontalis (L.) Hoffm. In 7030 and 7431, A.J.R. (1974).

P. leucophlebia (Nyl.) Gyeln. Knock Ore Gill, B.J.C. and O.L.G. (1981).

P. polydactyla (Neck.) Hoffm. Frequent on bare ground, Nether Hearth mine waste, P.W.J. (1966).

P. refescens (Weiss.) Humb. On mine heaps in Moor House pasture and in Rough Sike enclosure, P.W.J. (1966).

Pertusaria corallina (L.) Arnold. Common on sandstone, P.W.J. (1966).

P. lactea (L.) Arnold. On limestone mine heaps in Moor House pasture.

Petractis clausa (Hoffm.) Kremp. On limestone on mine heaps in pasture. Also Green Castle, B.J.C. and O.L.G. (1981).

Physcia adscendens (Th. Fr.) Oliv. em Bitt. Little Dun Fell Summit on sandstone, D.W. and P.W.J. (1966). Also Green Castle, B.J.C. and O.L.G. (1981).

P. caesia (Hoffm.) Hampe. Frequent on limestone, mine heaps.

P. leptalea (Ach.) DC. Common on limestone rocks around Moor House, Green Burn and on sandstone, Little Dun Fell. Queried by B.J.C. (1981).

Placynthium nigrum (Huds.) Gray. Green Castle, B.J.C. and O.L.G. (1981).

Polyblastia albida Arnold. On limestone in grassland, Knock Fell at 735 m. Also Green Castle, B.J.C. and O.L.G. (1981).

P. cupularis Massal. Green Castle, B.J.C. and O.L.G. (1981).

P. diminuta Arnold. Green Castle, B.J.C. and O.L.G. (1981).

P. dermatodes Massal. Green Castle, B.J.C. and O.L.G. (1981).

Porina chlorotica var. linearis (Leight) A.L.Sm. On limestone, Moor House pasture.

Protoblastenia calva (Dicks) Steiner. Green Castle, B.J.C. and O.L.G. (1981).

P. incrustans (DC) Steiner. Green Castle, B.J.C. and O.L.G. (1981).

P. rupestris (Scop.) Steiner. Common on rocks at Silverband, on limestone in Knock Quarry and Moor House pasture.

P. rupestris var. calva (Dicks.) Steiner. On limestone in Moor House pasture. Also Green Castle, B.J.C. and O.L.G. (1981).

Pseudevernia furfuracea (L.) Zopf. Little Dun Fell, B.J.C. and O.L.G. (1981).

Psora lurida (With.) Ach. Soil-filled crevices and ledges, Knock Ore Gill, B.J.C. and O.L.G. (1981).

Rhizocarpon geographicum (L.) DC. Common.

R. obscuratum (Ach.) Massal. Common on rocks.

R. oederi (Web.) Korb. On limestone among mine heaps in Troutbeck and Moor House pasture.

R. umbilicatum (Ram.) Flag. On limestone, common in Moor House pasture and Troutbeck mine heaps.

Solorina saccata (L.) Ach. Frequent in limestone grassland, Rough Sike, Knock Fell, C.J. (1955) and P.W.J. (1966).

Sphaerophorus fragilis (L.) Pers. Frequent on sandstone rocks, P.W.J. (1966).

Staurothele bacilligera (Arnold) Arnold. Knock Ore Gill, formerly known in Britain only from Ingleborough, B.J.C. and O.L.G. (1981).

S. caesia (Arnold) Arnold. On limestone, mine heaps in Troutbeck and Knock Quarry.

S. rupifraga (Massal.) Arnold. On limestone, Knock Fell, 740 m. O.D.

Sterocaulon dactylophyllum Florke. Common on limestone rocks, Nether Hearth mine heaps.

S. vesuvianum Pers. On sandstone rocks, Blea Crag, P.W.J. (1966).

Thelidium decipiens (Hepp ex Arnold) Kremp. On limestone in Knock Quarry, D.W., P.W.J. (1966).

T. incavatum Mudd. On limestone in Knock Quarry.

T. pyrenophorum (Ach.) Mudd. Green Castle, B.J.C. and O.L.G. (1981).

Thelocarpon laureri (Flot.) Nyl. On eroding banks of blanket peat with Coriscium viride. East side of Moss Burn, near to flush, P.W.J. (1966).

Toninia aromatica (Sm.) Massal. On limestone rock, mine heaps.

T. coeruleonigricans (Lightf.) Th. Fr. On base-rich soil, Crowdundle among Sesleria, 450 m. O.D. Knock Ore Gill, B.J.C. and O.L.G. (1981).

T. lobulata (Sommerf.) Lynge. On peat, Moss Burn. Soil-filled crevices and ledges, Knock Ore Gill, B.J.C. and O.L.G. (1981).

Tremolecia jurana (Schaerer) Hertel. Green Castle, B.J.C. and O.L.G. (1981).

Umbilicaria cylindrica (L.) Del. ex Duby. On rocks, Little Dun Fell and Cross Fell, P.W.J. (1966) and D.H. (1977).

U. deusta (L.) Baumg. Cross Fell, just off Reserve on summit escarpment rocks, R.W.M.C., det. B. Coppins.

U. hyperborea (Ach.) Hoffm. On Cross Fell, just off Reserve. Coll. R.W.M.C., det. P. Topham (1977).

U. polyphylla (L.) Baumg. On rocks, Little Dun Fell and Middle Tongue, P.W.J. (1966). Cross Fell, D.H. (1977).

U. proboscidea (L.) Schrad. Boulder scree, Little Dun Fell, B.J.C. and O.L.G. (1981).

U. torrefacta (Lightf.) Schrad. On rocks, Little Dun Fell, Cross Fell, D.H. (1977).

Usnea subfloridana Stirt. Growing over Peltigera sp. on meadow wall. Coll. M.W.R., det. P.W.J. (1969).

Verrucaria baldensis Massal. Green Castle, B.J.C. and O.L.G. (1981).

V. dufourii DC. On limestone, Moor House pasture mine heap.

V. glaucina Ach. Green Castle, B.J.C. and O.L.G. (1981).

V. hochstetteri Fr. On limestone, Knock Fell, P.W.J. (1966).

V. nigrescens Pers. On limestone, Moor House pasture.

V. praetermissa (Trevis.) Anzi. An aquatic lichen commonly found on rocks in Tees, N.T.H.H. (1976).

V. sphinctrina Ach. Limestone, Knock Quarry.

V. viridula (Schrader.) Ach. Green Castle, B.J.C. and O.L.G. (1981).

Xanthoria elegans (Link.) Th. Fr. Limestone wall, south side of Moor House meadow, P.W.J. (1966).

X. parietina (L.) Th. Fr. Frequent on limestone.

2. Fungi

Nomenclature follows Ainsworth (1971). Initials are:- M.W.R. (Mr. Read), P.H. (Mr. Houlton), P.M.L. (Miss Latter with Basidiomycete identification by Dr. T.F. Hering), J.D.S. (Mr. Drew Smith), D.A.R. (Dr. Reid), H.J.F. (Mr. Fletcher), J.T.P. (Mr. Palmer) and V.B. (Miss Blankley).

EUMYCOTA

Zygomycotina

Glomus fuegianus (Spegazzini) Trappe & Gerdemann Amongst Eriophorum and Nardus stricta. October J.T.P. (1962).

Mortierella alpina Peyronel Peat from (J) site. P.M.L. (1963).

M. humicola Oudemans & Koning Peat from (J) site. P.M.L. (1961).

Mucor hiemalis Wehm. Litter on (L) and (J) sites. P.M.L. (1961-3).

ASCOMYCOTINA

Apiocrea chrysosperma (Tulasne) Sydow Mid September growing parasitically on Paxillus involutus. P.H. (1972 and 1973).

Dasyscyphus apalus (Berkeley & Broome) Dennis Very common dead culms and leaves of Juncus effusus. P.M.L.

D. diminutus (Roberge) Sacc. June and November common on dead leaves of Juncus squarrosus. P.M.L. (1962-3).

D. virgineus S.F. Gray Late April to June growing on Calluna stems on Cottage Hill and Hard Hill. P.H. (1972 and 1973).

Endodothella junci (Fr.) Theissen & Sydow Widespread on Juncus effusus tips. H.J.F.

Hyaloscypha leuconica (Cooke) Nannfeldt On Calluna. September. P.M.L. (1967).

Hymenoscyphus repandus (Phillips) Dennis Early August on Cirsium detritus in pasture. P.H. (1972 and 1973).

Mollisia palustris (Roberge) Karst. Common on dead leaves of J. squarrosus.

Nectria cinnabarina (Tode ex Fr.) Fr. Throughout the year on rotting timber, growth inhibited only by severe frost. P.H. (1972 and 1973).

Neottiella rutilans (Fr.) Dennis Early October in a sheltered mossy hollow near pasture tree enclosure. P.H. (1972).

Peziza vesiculosa Bull. ex St. Amans Early August growing in mixed soil and coke cinders on sides of rubbish disposal shaft in pasture. P.H. (1973).

Pseudopeziza trifolii (Bivona-Bernardi ex Fr.) Fuckel Clover leaf spot on Trifolium repens. Trout Beck. H.J.F.

Ryparobius polysporus (Karst.) Sacc. November on relict hummock at Moss flats. P.M.L. (1961).

Sclerotinia cureyana (Berkeley) Karst. On J. effusus, May. P.M.L. (1966).

BASIDIOMYCOTINA

Agrocybe praecox (Pers. ex Fr.) Fayod Mid August in gritted soil by roadside at Dorthgill. Late June on Nardus dominated sward near Green Burn Level. P.H. (1972 and 1973).

Bolbitius vitellinus (Pers. ex Fr.) Fr. Early August among Urtica dioica at Lady Vein house. P.H. (1972).

Boletus elegans Schum. ex Fr. Mycorrhiza association with conifers found in pasture, Nether Hearth, Bog End and Force Burn tree enclosures. M.W.R. (1969).

B. luteus L. ex Fr. September - early October in all tree enclosures, except Green Hole, under conifers. P.H. (1972 and 1973).

Clavulinopsis helvola (Fr.) Corner Late September, growing on an Agrostis-Festuca dominated sward near confluence of Nether Hearth Sike and Rough Sike. P.H. (1973).

Clitocybe asterospora (J. Lange) Moser apud Gams Late September in mossy locality near most northerly tree enclosure at Force Burn. P.H. (1972). November (M) P.M.L. (1961).

Collybia maculata (Alb. & Schw. ex Fr.) Kummer The accepted habitat of C. maculata is "coniferous woods". (Collins Guide to Mushrooms and Toadstools). September, large specimens growing among Calluna east of Rough Sike on a site where timber, used to extricate a bogged-down tractor, had been buried some years ago (1972). October, large specimens in a flush on Hard Hill. The presence of buried man-introduced timber here seems unlikely. P.H. (1973).

C. palustris (Peck) A.H. Smith Mid September, among Sphagnum in pasture and on House Hill. P.H. (1972 and 1973).

Conocybe rickeniana Sing. ex P.D. Orton (= Galera spartea in Wakefield and Dennis, Common British Fungi). Mid October, until first frosts, on eroded peat and among Sphagnum on House Hill and near Green Hole. P.H. (1972 and 1973).

C. tenera (Schaeff. ex Fr.) Kuhn. During July along Moss Burn, Green Burn and Nether Hearth Sike on Nardus dominated swards. P.H. (1972 and 1973). October, Lodgepole Pine enclosure, Bog end, P.M.L. (1963).

Coprinus ephemerus (Bull. ex Fr.) Fr. Growing on sheep dung. M.W.R. (1969).

C. micaceus (Bull. ex Fr.) Fr. Mid August, near junction of Green Burn with Tees. Growth of this species is presumed to depend on the presence of wood detritus. P.H. (1972).

C. plicatilis (Curt. ex Fr.) Fr. Late September, near Rough Sike dam, caespitose on disturbed peat. P.H. (1973).

Cystoderma amianthinum (Scop. Fr.) Fayod Mid to late September, in mossy places along Upper Tees and Trout Beck. The expected habitat would be "among moss and needles in coniferous woods" (Collins Guide to Mushrooms and Toadstools). P.H. (1972 and 1973). October-November, (J) (M) (R) sites P.M.L. (1963-4).

C. carcharias (Pers. ex Secr.) Fayod Late September to early October, in Bog End tree enclosure under Pinus contorta. The conifer association is well-known. P.H. (1972 and 1973).

Deconica coprophila (Bull. ex Fr.) Karst. Mid September along Rough Sike path. This species usually occurs in association with horse manure. P.H. (1972 and 1973).

Galerina hypnorum (Schrank ex Fr.) Kuhn. Throughout the summer and autumn, ubiquitous in Sphagnum dominated areas. P.H. (1972 and 1973). June-November, mixed moor sites, usually with Sphagnum, occasionally C. vulgaris litter or moss. V.B. (1970-71).

- G. luteofulva P.D. Orton A minute species growing on eroded peat and disturbed peat along Rough Sike, early to mid October. P.H. (1972 and 1973).
- G. mniophila (Lasch) Kuhn. (M) October P.M.L. (1964).
- G. mycenoides (Fr.) Kuhn. (= Pholiota mycenoides in Wakefield and Dennis, Common British Fungi). As G. luteofulva above. P.H.
- G. mycenopsis (Fr. ex Fr.) Kuhn. September (M) P.M.L. (1963). September mixed moor sites, associated with Sphagnum. V.B. (1970).
- G. paludosa (Fr.) Kuhn. Widespread among Sphagnum. September to mid October P.H. (1972 and 1973). September-November (R), July (M), P.M.L. (1962-63). June-November, mixed moor sites, usually with Sphagnum occasionally with C. vulgaris litter, moss or peat. V.B. 1970-71.
- G. sphagnum (Pers. ex Fr.) Kuhn. From Mid June to late July among Sphagnum. P.H. (1972 and 1973). October (M) P.M.L. (1964).
- Gomphidius rutilus (Schaeff. ex Fr.) Lundell Valley bog, but normally found under pines.
- Hygrophorus coccineus (Schaeff. ex Fr.) Fr. Mid August along the west perimeter of pasture tree enclosure in an Agrostis-Festuca dominated area. P.H. (1972 and 1973). September (L) P.M.L. (1963).
- H. conicus (Scop. ex Fr.) Fr. September in a Nardus dominated sward along Great Dodgen Pot Sike. P.H. (1973).
- H. hypothejus (Fr. ex Fr.) Fr. Pine litter in Green Hole. October P.M.L. (1964).
- H. niveus (Scop.) Fr. November in lower pasture (only 2 specimens found) P.H. (1972). October (L) P.M.L. (1964).
- H. ovinus (Bull. ex Fr.) Fr. In Juncus sward near Green Hole. P.M.L. (1963).
- H. pratensis (Pers. ex Fr.) Fr. Early to mid September, in pasture in same habitat as H. coccineus above. P.H. (1972 and 1973), October (R) P.M.L. (1962).
- H. puniceus (Fr.) Fr. August, one large specimen, on heavily dung-enriched soil near Lady Vein house in same habitat as H. coccineus above. P.H. (1973). November (L) P.M.L. (1963).

H. turundus Fr. Along Rough Sike path; small specimens.

H. vitellinus Fr. s. Ricken (= H. citrinus in Collins Guide to Mushrooms and Toadstools). September, in pasture near Wind Tower - a delicate and very short-lived species. P.H. (1973).

Hypholoma elongatum (Pers. ex Fr.) Ricken Early to mid October, growing with moss on Nardus dominated locality next to Rough Sike. P.H. (1972 and 1973). September-October (R), November (M), October-November (J), P.M.L. (1962-64). September-October occasional records, mixed moor sites, associated with Sphagnum, or with Calluna litter, V.B. (1970-71).

H. ericaeoides P.D. Orton Mid September to October on eroded peat in pasture and on House Hill. P.H. (1972 and 1973).

H. ericaeum (Pers. ex Fr.) Kuhn. Late October, near House Hill erosion complex (1972). Late July, Eller Gill, Hardshins Mine, Burney Hill in various habitats, perhaps dung-associated (1973). Coll. P.H., det. D.A.R.

H. polytrichi (Fr. ex Fr.) Ricken From early October, common on eroded peat, especially on Moss Flats. Coll. P.H., det. D.A.R. (1972 and 1973).

H. udum (Pers. ex Fr.) Kuhn. Late summer widespread in Sphagnum dominated localities. Coll. P.H., det. D.A.R. (1972 and 1973). October (R, J and lodgepole pine enclosure, Bog End) P.M.L. (1963-64).

Laccaria laccata (Scop. ex Fr.) Cooke Early to mid September in Nether Hearth and pasture tree enclosures and at Green Hole growing under and near Sorbus. P.H. (1972 and 1973).

L. proxima (Boud.) Pat. Pine litter in Green Hole. October, P.M.L. (1964).

Lactarius rufus (Scop. ex Fr.) Fr. Mid September to late October, under conifers in all tree enclosures except Green Hole. P.H. (1972 and 1973).

L. turpis (Weinm.) Fr. Mid September in Nether Hearth tree enclosure under conifers. P.H. (1973).

Lycoperdon ericetorum (Pers.) Mid to late September on Agrostis Festuca dominated swards along Nether Hearth Sike and Upper Teesdale. Widespread on stems of old Calluna. P.H. (1972 and 1973).

Marasmius androsaceus (L. ex Fr.) Fr. July to September, growing on stems of old Calluna widespread in many parts of the Reserve. P.H. (1972 and 1973). November (R), September-November (M), on senescent, or dead, leaves and stems of C. vulgaris, J. squarrosus, N. stricta, E. vaginatum and R. chamaemorus. P.M.L., 1962-64. June-November, mixed moor sites, usually associated with C. vulgaris or E. vaginatum litter, occasionally Sphagnum. V.B. 1970-71.

M. oreades (Bolt. ex Fr.) Fr. Mid June, small colonies growing on Nardus dominated swards near Eller Gill and Sink Beck. P.H. (1972).

Mycena epipterygia (Scop. ex Fr.) S.F. Gray From early October in grassy habitats of differing types. P.H. (1972 and 1973). October (L.R.) November (M), P.M.L. (1963-64).

M. fibula (Bull. ex Fr.) Kuhn. Mid September to early October, in the damper Nardus dominated areas along Moss Burn and Rough Sike. P.H. (1972 and 1973). Also found in valley bog.

M. galopus (Pers. ex Fr.) Kummer Pine litter in Green Hole. October P.M.L. (1964).

M. swartzii (Fr. ex Fr.) A.H. Smith Mid September to early October, habitat and distribution same as for M. fibula above. P.H. (1972 and 1973). Also found in valley bog.

Mycocalia denudata (Fr.) J.T. Palmer On dead Juncus effusus, near house October J.T.P. (1962).

M. minutissima (J.T. Palmer) J.T.P. Leaf sheaths of J. effusus, near house, and middle and upper reaches of Troutbeck. October. J.T.P. (1962).

Naucoria escharoides (Fr. ex Fr.) Kummer Late September, on eroded peat in House Hill erosion complex and on Moss Flats. In Wakefield and Dennis, Common British Fungi, it is described as growing "always under alders". P.H. (1972).

N. permixta P.D. Orton Found on Moss Flats.

Nolanea sericea (Bull. ex Merat) P.D. Orton Early October, on Agrostis Festuca swards along upper Tees. Coll. P.H., det. D.A.R. (1972 and 1973). Rough Sike, October, P.M.L. (1963).

N. staurospora Bres. Common from mid June to late September, in Agrostis-Festuca dominated localities along the Tees, Knock Ore Gill, Force Burn, Rough Sike and Trout Beck. Coll. P.H., det. D.A.R. (1972 and 1973). November (R. M.) P.M.L. (1963).

Omphalina epichysium (Pers. ex Fr.) Quel. Late September in Sphagnum near Bog End tree enclosure. P.H. (1972).

O. ericetorum (Fr. ex Fr.) M. Lange From mid June to mid October, perhaps the most widespread fungus on the Reserve, found in association with both Calluna and Sphagnum. P.H. (1972 and 1973). November (P), July-September (R), June-November (M), September (J) P.M.L. (1963-64). June-September, Mixed moor sites, usually with Sphagnum, occasionally in moss or peat. V.B. (1970-71). Also collected by P.A. Buxton, det. D.A.R. as O. umbellifera.

O. sphagnicola (Berk.) Moser apud Gams Late August to September in many Sphagnum dominated areas. P.H. (1972 and 1973). August-September, mixed moor sites always with Sphagnum. V.B. (1970-71).

Panaeolina foenisecii (Pers. ex Fr.) Maire Early June on Nardus dominated and heavily sheep-dunged swards between west fell gate and Sink Beck.

Panaeolus campanulatus (Bull. ex Fr.) Quel. Late June to mid August, habitat as for Panaeolina foenisecii above and also found growing near Green Burn level. P.H. (1972 and 1973).

P. rickenii Hora Early July in rank Nardus near Rough Sike filter tanks. P.H. (1972 and 1973).

Paxillus involutus (Batsch ex Fr.) Fr. Early to mid September in Nether Hearth and pasture tree enclosures under and near conifers (some large specimens of up to 10 cm across pileus). P.H. (1972 and 1973).

Pholiota alnicola (Fr.) Sing. Found by Rough Sike Dam, normally found on alder.

P. myosotis (Fr. ex Fr.) Sing. Late September to mid October mostly on eroded peat on House Hill and along Rough Sike. Coll. P.H., det D.A.R. (1972 and 1973).

Pistillaria sp. Fr. Growing in Agrostis-Festuca grassland. Rough Sike. P.M.L. (1961).

Pleurôtellus acerosus (Fr.) Konrad & Maubl. In flushes, growing on bryophyte Drepanocladus revolvens. Coll. P.H., det. D.A.R. (1973).

Psathyrella gracilis (Fr.) Quel. Late August to mid September on Nardus dominated swards on Great Dun Fell and along upper Tees. P.H. (1972 and 1973).

P. nolitangere (Fr.) Pearson & Dennis Mid October, growing out of perpendicular shale surface in an underground cavity near Rough Sike - an uncommon sp., with exceptionally small spores. P.H. (1972).

Psilocybe semilanceata (Fr. ex Secr.) Kummer September to October, growing in colonies on Nardus dominated swards along Moss Burn, Nether Hearth Sike and Rough Sike. Coll. P.H., det. D.A.R. (1972 and 1973).

Stropharia merdaria (Fr.) Quel. October in heavily sheep-dunged area of pasture. P.H. (1972).

S. semiglobata (Batsche ex Fr.) Quel. Widespread over much of the Reserve in association with sheep dung, June-November (R), November (M), October-November (J), November (L), P.M.L. (1962-64). Also a large and more umbonate form. Found throughout August under Rough Sike filter tanks, described as var. stercororia by collector.

Trachyspora intrusa (Grev.) Arth. Parasitic rust spot on Alchemilla glabra, found in meadow. H.J.F.

Tricholoma sp. Found in Green Hole, October, P.M.L. (1963).

Typhula incarnata Lasch ex Fr. Grey snow mould on grass leaves in late winter - spring. J.D.S. (1978).

Uromyces dactylidis Otth Rust fungus recorded on the grass Dactylis glomerata in the meadow. H.J.F.

DEUTEROMYCOTINA (Fungi Imperfecti).

Alternaria tenuis Nees ex Pers. Juncus leaves, P.M.L. (1962).

Aureobasidium pullulans (de Bary) Arn. Soil from (L) (J) (M) sites. P.M.L. (1961-63).

Bisporomyces chlamyosporis Van Beyma Soil from (J) site. P.M.L. (1963).

Cladosporium sphaerospermum Penzig J. squarrosus litter and peat, May-July, P.M.L. (1963).

Cylindrocarpon destructans (Zins) Schultze (L) site. P.M.L. (1962).

Dinemasporium graminum Lev. July-October, common on J. squarrosus, P.M.L. (1962).

Epicoccum purpurascens Ehrenb. ex. Schlecht J. squarrosus litter. April-November, P.M.L. (1961-63).

Fusarium avenaceum (Fr.) Sacc. (L) site. P.M.L. (1961).

F. nivale (Fr.) Ces.

Geomyces vulgare Traaen (M) site. P.M.L. (1963).

Oidiodendron tenuissimum (Peck) Hughes Isolated from cotton strips on all sites (L.J.M.P.) P.M.L. (1964).

Penicillium adametzi Zaleski H.J.F.

P. chrysogenum Thom On mineral soil. H.J.F.

P. frequentans Westling Juncus and relict hummocks, P.M.L. (1961-63).

P. janthinellum Biourge H.J.F.

P. melinii Thom Soil from (L) and (J) sites. P.M.L. (1961-63).

P. nigricans (Bainier) Thom H.J.F.

P. spinulosum Thom Litter and peat, all sites (L.J.M.P.) P.M.L. (1961-63).

P. thomii Maire Litter region of all sites (L.J.M.P.) P.M.L. (1961-63).

Phialophora fastigiata (Lagerb. & Mel.) Conant. Soil from (J) and (P) sites.
P.M.L. (1963).

Septoria rubi Sacc. Widespread on leaves of Rubus chamaemorus, the
Cloudberry. H.J.F.

Stagonospora innumerosa Sacc. J. squarrosus litter. P.M.L. (1962-64).

Tolypocladium cylindrosporum Gams Soil and litter from (J) (M) sites.
P.M.L. (1961-63 and 1967).

T. geodes Gams Soil from (L) (J) (M) sites. P.M.L. (1961-63 and 1967).

Trichoderma viride Pers. ex Fr. Soil from all sites (L) (J) (M) (P).
P.M.L. (1961-63).

Abbreviations for sites used for P.M.L. collections.

Festuca-Agrostis grassland site near Rough Sike, NY 757328 (L); Calluna
mixed moor, sites at Bog End and the area between Moss Flats and Bog End
(M); Juncus squarrosus site at Bog End, NY 766329 (J); Bare peat at Moss
Flats (P); Nardus grassland along Rough Sike (R).

3. Algae

Nomenclature is usually according to West and Fritsch (1968). Collections and determinations by R.W. Butcher (R.W.B.) from his survey of the Tees, at Troutbeck Foot, 1929-33; M. Woern (M.W.) May, 1973; N.T.H. Holmes and B.A. Whitton (H. and W.) 1976; and A.J. Peabody (A.J.P.) 1964.

MYXOPHYTA (BLUE-GREEN ALGAE)

Anabaena sp. Knock Tarn, A.J.P.

Calothrix marchica Lemm. On rocks in the Tees, rare, H. and W.

C. parietina (Nageli) Thuret. On rocks in the Tees, occasional, H. and W.

Chamaesiphon confervicola Braun. Common as an epiphyte on bryophytes.

C. fuscus (Rostaf.) Hansg. Occasional, H. and W.

C. geitleri Luther. Brown flecks on stones in calcareous flushes, H. and W.

C. incrustans Grun. Common but sporadic in the Tees, R.W.B.

C. minutus (Rostaf.) Lemm. As an epiphyte on Tolypothrix, H. and W.

C. polonicus (Rostaf.) Hansg. Common, H. and W.

C. polymorphus Geitler. Common, H. and W.

Chroococcus Naegeli spp. Occasional, H. and W.

Clastidium setigerum Kirchner. Occasional, on rocks, H. and W.

Gloeocapsa sanguinea (Ag.) Kutz. Occasional, H. and W.

Homoeothrix varians Geitler. On rocks in the Tees, occasional, H. and W.

Lyngbya Vanden Berghenii Symoens. Endolithic in calcareous pebbles in the Tees, H. and W.

Lyngbya sp. Associated with sewage in Nether Nearth Sike.

A. flexella Kutz. Occasional, H. and W.

A. lanceolata Breb. Very common in the Tees, R.W.B.

A. lapponica Hustedt. Occasional, H. and W.

A. linearis (W. Sm.) Grun. Abundant in the Tees, R.W.B.

A. microcephala (Kutz.) Grun. Abundant in the Tees throughout the year and dominant in the summer, R.W.B.

A. minutissima Kutz. Very common in the Tees, R.W.B.

Anomoneis exilis (Kutz.) Clere. Common, H. and W.

Asterionella formosa Hassall. Rare in the Tees, R.W.B.

Ceratoneis arcus (Ehr.) Kutz. Very common in the Tees, R.W.B.

Cocconeis pediculus Ehr. Rare in the Tees, R.W.B.

C. placentula Ehr. Common in the Tees, R.W.B.

C. thumensis A. Mayer. Rare, H. and W.

Coscinodiscus lacustris Grun. In bog pools.

Cymbella affinis Kutz. Very common in the Tees, R.W.B.

C. bipartita A. Mayer. Occasional, H. and W.

C. cesatii (Rabh.) Grun. Common, H. and W.

C. cistula (Hempr.) Grun. Rare in the Tees, R.W.B.

C. delicatula Kutz. Very common in the Tees, R.W.B.

C. helvetica Kutz. Common but sporadic in the Tees, R.W.B.

C. lanceolata (Ehr.) Van Heurck. Common in the Tees, R.W.B.

C. pusilla Grun. Very common in the Tees, R.W.B.

C. sinuata Greg. Abundant in the Tees, R.W.B.

C. ventricosa Kutz. Abundant in the Tees, R.W.B.

C. spp. Moss Burn and Nether Hearth Sike.

Denticula tenuis Kutz. Occasional, H. and W.

Diatoma elongatum (Lyngb.) Agardh. Common, H. and W.

D. hiemale (Lyngb.) Heiberg. Occasional H. and W.

D. vulgare Bory. One of the commonest diatoms in the Tees, R.W.B.

D. sp. Occasional in the Tees, R.W.B. Knock Tarn and Moss Burn.

Didymosphenia geminata (Lyngb.) Schmidt. Very common in the Tees, R.W.B. A species of very restricted range in the British Isles.

Epithemia sp. Sporadic, H. and W.

Eunotia arcus Ehr. Sporadic, H. and W.

E. pectinalis (Dillwyn) Rabh. Sporadic, H. and W.

E. tenella (Grun.) Hust. Sporadic, H. and W.

Fragilaria brevistriata Grun. H. and W.

F. crotonensis Kitton. Common, H. and W.

F. gracillima Mayer. Rare and sporadic in the Tees, R.W.B.

F. vaucheriae (Kutz.) Boye P. Very common in the Tees, R.W.B.

F. virescens Ralfs. Rare in the Tees, R.W.B.

Gomphonema acuminatum Ehr. Common, H. and W.

G. angustatum (Kutz.) Rabh. Common in the Tees, R.W.B.

G. constrictum Ehr. Rare, H. and W.

G. intricatum Kutz. Rare in the Tees, R.W.B.

G. lanceolatum Ehr. Common in the Tees, R.W.B.

G. longiceps Ehr. Rare, H. and W.

G. olivaceoides Hustedt. Common, H. and W.

G. olivaceum (Lyngb.) Kutz. Abundant in the Tees, R.W.B.

G. parvulum (Kutz.) Grun. Very common in the Tees, R.W.B.

G. tergestinum (Grun.) Fricke. Occasional, H. and W.

G. sp. Moss Burn and Nether Hearth Sike.

Meridion circulare Ag. Common, H. and W.

Navicula anglica Ralfs. Common in the Tees, R.W.B.

N. bacillum Ehr. Rare in the Tees, R.W.B.

N. cryptocephala Kutz. Very common in the Tees, R.W.B.

N. gracilis Ehr. Common in the Tees, R.W.B.

N. radiosa Kutz. Rare in the Tees, R.W.B.

N. veneta Kutz. Rare, H. and W.

N. spp. Two species recorded in a sink-hole on Knock Fell.

Nitzschia acuta Hantzsch. Rare in the Tees, R.W.B.

N. dissipata (Kutz.) Grun. Very common but sporadic in the Tees, R.W.B.

N. frustulum Kutz. Rare, H. and W.

N. palea (Kutz.) W. Smith. Abundant in the Tees, R.W.B.

N. sublinearis Hust. Common but sporadic in the Tees, R.W.B.

N. subtilis (Kutz.). Rare and sporadic in the Tees, R.W.B.

Pinnularia spp. H. and W.

Rhoicosphenia curvata (Kutz.) Ehr. Moss Burn.

Rhopalodia parallela (Grun.) O. Mull. H. and W.

Synedra acus Kutz. Very common in the Tees, R.W.B.

S. amphicephala Kutz. Rare in the Tees, R.W.B.

S. pulchella (Ralfs) Kutz. Common in the Tees, R.W.B.

S. tenera Gregory. Common but sporadic in the Tees, R.W.B.

S. ulna (Nitzsch.) Ehr. Occasional in the Tees, R.W.B.

Tabellaria fenestrata (Lyngb.) Kutz. Rare, H. and W.

T. flocculosa (Roth.) Kutz. In the Tees R.W.B., and in Nether Heath Sike and Moss Burn.

T. spp. Rare in the Tees, R.W.B.

RHODOPHYTA (RED ALGAE)

Batrachospermum onoprecoegiron Rough Sike, M.W.

B. sp. Occasional in the Tees, H. and W.

Lemanea fluviatilis (L.) J. Ag. Common in all streams, R.W.B., H. and W.

"Chantransia". Chantransia stages of Batrachospermum and Lemanea have been recorded, H. and W., R.W.B.

Rhodochorton violaceum (Kutz.) Drew. Occasional in the Tees, H. and W.

CHLOROPHYTA (GREEN ALGAE)

Chaetopeltis megalocystis Schmidlel. Dominant in the Tees in spring and summer, R.W.B.

Chaetophora incrassata (Huds.) Hazen. Very common in the Tees, H. and W.

C. pisiformis Roth. Rare at Troutbeck Foot, R.W.B.

Chlamydomonas sp. In bog pools, probably widespread.

Chlorococcum infusionum (Schränk) Menegh. Knock Tarn.

Chlosterium leibleinii Kutz. Common in the Tees in summer, R.W.B.

C. moniliferum (Bory). Rare in the Tees, R.W.B.

C. sp. Nether Hearth Sike and a sink-hole on Knock Fell.

Coleochaete nitellarum Jost. Epiphyte associated with Nitella opaca, H. and W.

Cosmarium turpinii Breb. Rare in the Tees in summer, R.W.B.

C. undulation Rare in the Tees in summer, R.W.B.

Cylindrocapsa sp. Nether Hearth Sike.

Cylindrocystis sp. In bog pools.

Draparnaldia sp. Rough Sike, M.W.

Euastrum sp. In bog pools.

Eudorina sp. In bog pools.

Gongrosira sp. In bog pools.

Microspora sp. In bog pools.

Mougeotia sp. Rough Sike, M.W. Frequent in the Tees, H. and W.

Oedogonium sp. In a sink-hole on Knock Fell.

Pandorina sp. In bog pools.

Pediastrum boryanum (Turp.) Menegh. Rare in the Tees, R.W.B.

Prasiola crispa (Light.) Menegh. On boulders by the Tees, associated with bird droppings, H. and W.

Spirogyra sp. Moss Burn.

Spondylosium sp. In a bog pool on Knock Fell.

Staurostrum bienianum Raben. Rare in the Tees in summer, R.W.B.

S. sp. In a bog pool and sink-hole on Knock Fell.

Stigeoclonium falklandicum var. anglicum Butcher. Common in the Tees, R.W.B.

S. tenue Kutz. Common, H. and W.

S. sp. Nether Hearth Sike.

Trentepohlia aurea (L.) Mart. Common on damp walls and rocks, particularly of Carboniferous limestone.

Ulothrix subtilissima Rabh. Abundant in streams in spring and summer, R.W.B.

U. zonata (Web. and Mohr) Kutz. Abundant in streams, especially in spring, R.W.B.

Ulvella frequens Butcher. Abundant in streams in summer, R.W.B.

Volvox sp. In a sink-hole on Knock Fell.

Zygnema sp. Very common in streams, H. and W.

Zygogonium ericetorum Kutz. Very common, colonising bare peat.

CHARAPHYTA (STONEWORTS)

Chara vulgaris L. In calcareous flushes, H. and W.

Nitella opaca C. A. Ag. Frequent in the Tees, H. and W.

N. spp. Rough Sike, M.W., and in Nether Hearth Sike, Troutbeck and the Tees by D.M. Tattersfield (July 1973).

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